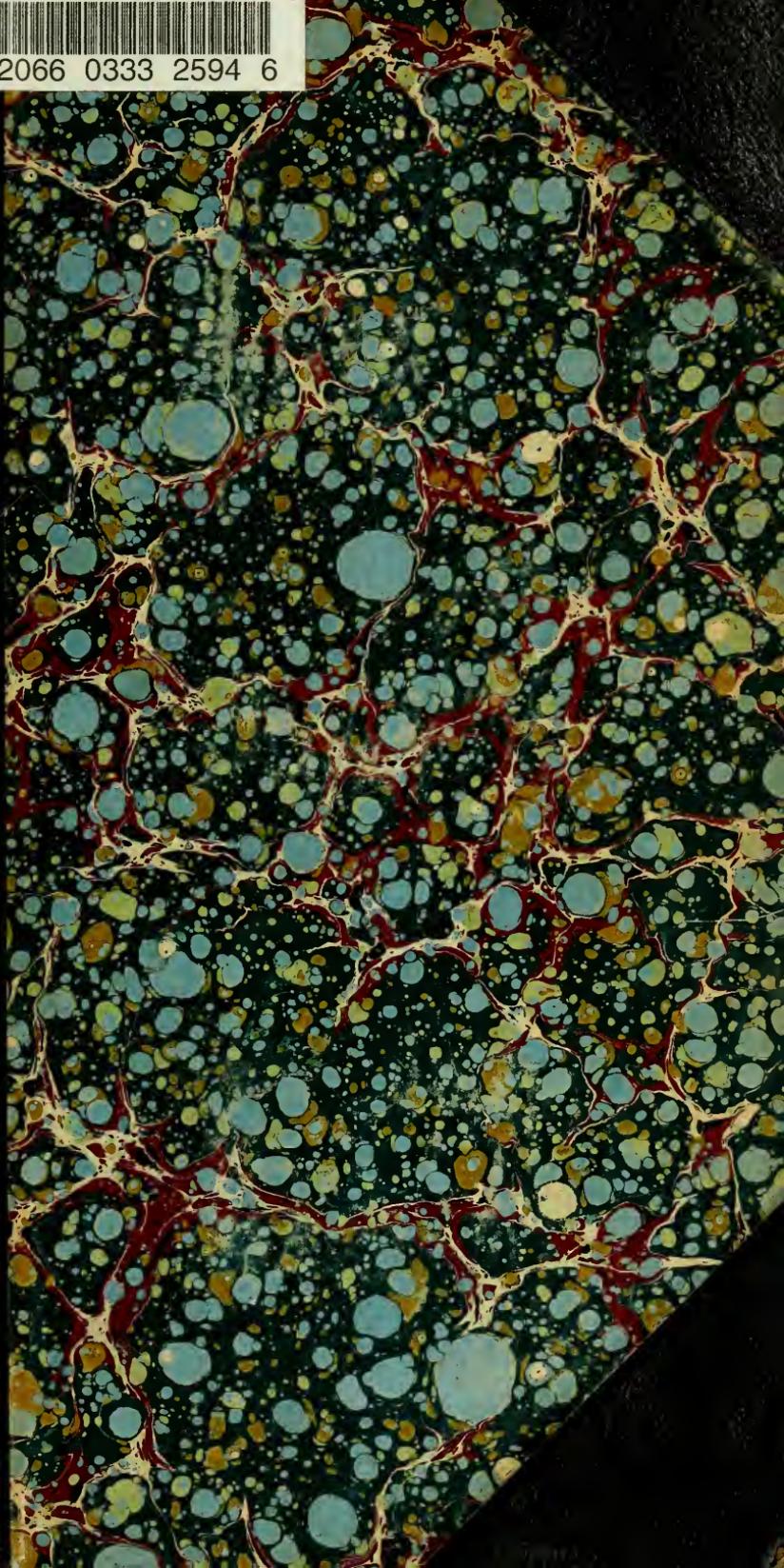


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SERIES OF 1901.

BULLETIN No. 1.

MASSACHUSETTS

CROP REPORT

FOR THE

MONTH OF MAY, 1901.

ISSUED BY

J. W. STOCKWELL,
SECRETARY STATE BOARD OF AGRICULTURE.

BOSTON:

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The average condition of meadow mowing lands was 92.8, against 90.8 on May 1 of last year, 84.9 in 1899, and 91.1, the mean of the May averages of the last ten years.

The average condition of spring pastures was 91.5, against 91.3 on May 1 of last year, 83.5 in 1899, and 90.8, the mean of the May averages of the last ten years.

The proportion of spring plowing done by May 1 was 66.3 of the total contemplated, as compared with 68.4 last year, 57.2 in 1899, and 71.3, the mean of the May averages of the last ten years. Only thrice in the last fifteen years has the percentage done by May 1 been as low as it was this year.

WEATHER SUMMARY, JAN. 1 TO MAY 1, 1901.

[FURNISHED BY THE WEATHER BUREAU, BOSTON.]

The weather of January was without special features, and therefore generally characteristic of the month. There was about the usual amount of cloudiness and sunshine, and the number of stormy days was about the usual average. The average precipitation for the entire State, 2.02 inches, was about an inch below the average. It was well distributed throughout the month and over the territory, and the deficiency was for this reason unimportant. There were no severe or destructive storms, the disturbances being of the character of those usually experienced in New England during January. The monthly temperature was about the normal for the season, and quite even throughout the month. The snowfall was less than the average, but, on account of the absence of the usual "thaw," the ground was generally covered through the month.

February was exceptionally pleasant. During 15 days of the month the skies were cloudless, and there was an average of but 6 cloudy days. The precipitation for the month was remarkably light, the monthly average being but .88 of an inch, and this fell chiefly during one storm, that of the 4th and 5th. The snowfall was light, averaging about 10 inches, but, owing to the prevailing low temperature, much of it remained on the ground until the close of the month. The temperature formed a conspicuous feature of the month, it being uniformly low, with the monthly average about 3° below the normal. Notwithstanding the low monthly mean,

there were no unusual ranges in the maxima and the minima of the month. The weather of the month will seldom be equalled in February.

March like the preceding month, was unusually pleasant, as compared with the average month of this name in New England. While the weather was marked by much cloudiness, and the monthly precipitation was in excess of the average, there were but 12 stormy days. The precipitation was mostly in the form of rain, and was well distributed. The large amount of water was needed, and was therefore of much and general benefit to the manifold interests of the State. The temperature was near the seasonal average, the slight departure being above the normal. There were no severe or protracted storms.

April was cloudy, wet and cold. The skies were wholly overcast on an average of 19 days and rain fell on 15 days. The precipitation was excessive in all sections, and averaged nearly double the normal amount. To add to the uncomfortable conditions of the weather was much fog in coast sections and almost continuously easterly winds throughout the State. The mean temperature averaged about 1° below the normal for the month.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending May 6.—The week was decidedly warm throughout the central valleys and Lake region, the interior portions of the Atlantic coast and Gulf States, and over the central and northern portions of the eastern Rocky Mountain slope. Over the western portions of the Plateau region, in the Pacific Coast States, southern Florida, on the North Carolina coast and in New England the week averaged cooler than usual. In the central Missouri valley and over comparatively limited areas in the upper Lake region, southern New England, portions of southern New York and northern Pennsylvania, in central Illinois, south-eastern Kansas and north-eastern Texas there was more than the average weekly rainfall. The week was, however, drier than usual over much the greater part of the country, nearly the whole of

the Gulf and south Atlantic States receiving no measurable amount.

Week ending May 13.—The week was cooler than usual in the Missouri, upper Mississippi and lower Ohio valleys, and over the western portions of the upper Lake region. The week was also slightly cooler than usual on the middle Pacific coast over the extreme southern portions of Texas and Florida, and on the middle Atlantic coast. Over the eastern portions of the Lake region, upper Ohio valley, New England, generally throughout the south Atlantic and Gulf States, the eastern Rocky Mountain slope, the Plateau districts and the greater part of the Pacific coast, the week was warmer than usual. The precipitation of the week was very unevenly distributed, being in excess over limited areas in the upper Mississippi and upper Ohio valleys, with a general and decided excess over the greater part of New England. Elsewhere throughout the country the rainfall was generally deficient, and in many sections decidedly so.

Week ending May 20.—The week averaged slightly cooler than usual in the lower Lake region, upper Ohio valley, southern New England, middle Atlantic States, northwestern Texas and on the Pacific coast. Over the western portions of the upper Lake region and from the upper Mississippi valley westward to Idaho and Utah the week was decidedly warm, and generally throughout the southern States the temperature of the week averaged above normal. Very heavy rains fell over Oklahoma, Indian Territory, northern Texas and portions of Arkansas, Missouri, Kansas and Colorado, where the total fall for the week ranged from 1 to more than 3 inches. There were also very heavy rains over the northern portions of the Gulf States, Tennessee, the Carolinas, southern Georgia and over the greater part of New England. There was less than the usual rainfall throughout the central valleys and Lake region and in the middle Atlantic States, a considerable portion of the upper Missouri and Mississippi valleys receiving no measurable amount.

Week ending May 27.—The week was decidedly cool in the central valleys, Lake region, middle Atlantic and southern States, and over the greater part of the Pacific

coast region. The week averaged slightly warmer than usual on the south Atlantic coast, in extreme northern New England, the upper Missouri valley, and over the central and northern Plateau region and north Pacific coast. Very heavy rains fell during the week in the central and upper Ohio valley, middle and south Atlantic and east Gulf States, and also over the greater part of the Lake region and in portions of the central Gulf States and Texas. The precipitation was below the average for the week in the central Mississippi valley, generally throughout the Missouri valley, over portions of the central and west Gulf districts, limited areas in the middle Atlantic States and Lake region, on the north Pacific coast, in the central Plateau region and over a considerable portion of Oklahoma and western Arkansas.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending May 6. — New England. Boston: First part of week warm and fair, last part cool, with frosts, and unfavorable; much plowing, but ground too wet and cold for seeding and planting; gardening well advanced; fruits promising; sunshine and warm weather needed; season ten days late.

Week ending May 13. — New England. Boston: Very favorable for farm work, but low ground remains too wet; grass excellent; potato planting begun; peaches, plums and cherries in heavy bloom; warm, drying weather needed.

Week ending May 20. — New England. Boston: Favorable weather caused rapid advancement of work, and crops and grass in finest condition; potatoes generally planted; much ground too cold and wet; little corn planted; small fruits promise abundant crop; winter apple blossom light; tobacco plants poor.

Week ending May 27. — New England. Boston: Cold, wet weather delayed work and growth of crops; grass excellent, growing rapidly; other crops making slow progress; potato planting generally completed; but little corn planted, ground too cold and wet; small fruits promise well.

THE WEATHER OF MAY, 1901.

The month opened with generally cloudy weather and copious showers on the 1st and 2d, with temperature slightly below the normal. Then followed nearly a week of clear weather with seasonable temperature, ranging near normal, and without marked extremes of high or low temperature. Cloudy weather again developed on the 9th, and rainy weather was nearly continuous from that date until the 14th. Though the total rainfall for this period was copious, no large amounts fell on any one date. The temperature continued moderate. Though frosts occurred in interior parts of the State on several dates during the first two weeks of the month, no damage was reported, owing to the somewhat backward season. Following the 13th, clear and pleasant weather with moderate and seasonable temperature prevailed until the 18th. During the period of rainy weather which began on the 18th and continued through the 20th, heavy rains occurred in nearly all parts of the State. The temperature during this time was generally moderate, and without marked departure from normal except in coast sections, where easterly winds caused it to continue cool for the season. During the 21st, 22d and 23d, scattered showers occurred, but of only light amounts, and there was considerable sunshine, with the highest temperatures yet experienced the present season. Over nearly all parts of the State the temperature rose to near or slightly above 80° on the 22d and 23d, but the warm wave was broken on the morning of the 24th, the temperature falling between 20° and 30° during the remainder of the day and night. The fall in temperature caused general showers, but which were light, except in the north-eastern portion of the State. The continuance of cold north and east winds after the 25th caused cloudy weather with low temperature to continue well into the last week of the month. Though the temperature for the month has not varied greatly from normal, it has been without the warm days usually experienced in May, making the growth of vegetation slow and backward. The rainfall has been in excess of the normal, so much so that at the end of the month low lands continued to be too wet to be worked, the frequent rains also delaying work on higher ground.

conditions in the future. There are a few complaints of fall seeding winter-killing, but in general it wintered well, and is now in excellent condition.

FRUIT BLOOM.

The fruit bloom was excellent for all kinds of fruit except apples. Winter apples made a light bloom and other apples only a fair one in most sections, probably owing to the year being generally an off year and the crop of last year having been unusually heavy. Strawberries appear to be setting well and other berries bloomed well. No damage from frost was reported from any section.

INSECTS.

Insects are doing practically no damage as yet, many correspondents reporting that none had appeared at the time of making returns. The tent caterpillar is the one most generally reported, and they are not far enough advanced to do any noticeable amount of damage. Other insects reported as present are canker worms, cut worms, currant worms, potato bugs, onion maggots, wire worms, elm beetles, asparagus beetles, cattle flies and brown-tail moths.

SPRAYING.

The returns again indicate that, while spraying is practised and is constantly increasing, the proportion done to that which could be profitably done is not large, nor is the increase as rapid as it should be. Some correspondents report that little spraying will be done, owing to its being an off year for apples. We can only repeat our former advice to all farmers to spray, even where fruit is a very minor part of their product, as no outlay they can make will be more immediately profitable to them.

FARM HELP AND WAGES.

There are more reports than usual of a scarcity of farm help, pointing to a somewhat smaller supply than usual in certain localities; but there is, generally speaking, a fair supply of fairly good help. The supply of strictly first-class

help is of course not equal to the demand. Wages average about \$18 per month with board, and from \$30 to \$36 per month without board. Wages for day work range from \$1.25 to \$1.50 per day, in accordance with the locality and season. There are some few reports of higher wages, but not enough to affect the general average.

ACREAGE OF FARM CROPS.

There will be no marked changes in the acreage of farm crops, although the acreage of corn and tobacco will be slightly increased. A few reports indicate a decrease in the acreage of potatoes, but not enough were received to base a general statement on. The only strictly new enterprise reported was the establishment of two hop farms on Martha's Vineyard.

NOTES OF CORRESPONDENTS.

[Returned to us May 23.]

BERKSHIRE COUNTY.

Mount Washington (H. M. WEAVER).—Although the season has been very wet, the present outlook, agriculturally speaking, is very favorable. Pastures and mowings promise well, and fall seeding wintered well. There was a full average fruit bloom. No insects are doing damage at present. Spraying is not practised by our farmers. Farm help is plenty, and one-tenth of it is good help. Wages average \$20 per month with board and \$30 per month without board. I think the acreage of corn has been increased a third; everything else about as usual.

Otis (S. H. NORTON).—The season is backward, owing to wet weather. Pastures and mowings are looking very well. The fruit bloom is about an average one. Tent caterpillars are quite numerous. Spraying is not practised here. Farm help is very scarce. Wages are from \$18 to \$20 per month with board and from \$1.25 to \$1.50 per day without board. There will be no change in the acreage of farm crops.

Alford (L. T. OSBORNE).—On the whole, the season promises rather better than the average. Temperature and moisture have afforded perfect conditions for pastures and mowings, and they are above the normal. The fruit bloom has been about 50 for apples and 110 for pears and cherries. Tent caterpillars are doing some damage at present. Spraying is far from universal, but is on the increase. Farm help is very scarce, and there is but little first-class help. The best help is engaged by wealthy people, at prices much beyond the means of ordinary farmers. Wages, \$30 per month with board for the best help and \$15 per month and board for boys from sixteen to eighteen years old. There is but little change in the acreage of farm crops, milk being about the only thing farmers can live by in this section.

Stockbridge (F. A. PALMER).—The present season compares well with the average, agriculturally speaking. Pastures and mowings are in fine condition, and fall seeding wintered well. Pears

and peaches were above par as to bloom, and apples look well. Spraying against insects is slightly on the increase, but is still quite limited. Farm help is scarce, and one in five good help. Wages average \$20 per month with board and from \$40 to \$45 per month without board. More corn is planted with us each year.

Washington (E. H. EAMES). — The present season promises better than for two years past. Pastures and mowings promise better than for two years past. There is not much fruit bloom as yet. No insects are doing damage at present. Spraying is not practised at all with us. Farm help is scarce, and very poor. Wages are from \$15 to \$20 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture. Farmers are rather backward in planting crops, owing to rainy weather.

Hancock (C. H. WELLS). — The season is late, on account of heavy rains. Pastures and mowings look finely. Fruit of all kinds promises an abundant yield. No insects are doing damage as yet. Very little spraying is done, and it is not on the increase. Farm help is rather scarce, and half of it is good help. Wages average \$18 per month with board and \$25 per month without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Cheshire (L. J. NORTHRUP). — The season is two weeks later than for several years. The promise for pastures and mowings is first class, and fall seeding looks well. Cherries and plums are blooming well, apples not yet in bloom. Tent caterpillars promise to be as active as usual. Not much if any spraying is being done in this locality. Farm help is about the same as in former years, probably 25 per cent of it good help. Wages are from \$15 to \$20 per month with board and from \$25 to \$35 without board. No changes in the acreage of farm crops.

Florida (E. D. RICE). — The season is about two weeks later than usual. Grass is looking well, owing to the wet weather. Fruit trees are in full bloom, and an average crop of apples is promised. No insects have appeared yet. Spraying is not practised to any appreciable extent in this town. Farm help is in good supply, and 80 per cent of it is good help. Wages are \$1 per day with board and from \$1.25 to \$1.50 per day without board. Our farmers are probably raising more and more of the feed for their stock every year.

Williamstown (S. S. HICKOX). — The season is an average one, agriculturally speaking. Pastures and mowings promise well, and fall seeding wintered well. The fruit bloom compares well with former years. Tent caterpillars are doing some damage. Spray-

ing is practised by a fourth of our farmers, and is on the increase. Good farm help is scarce, but there is plenty of poor help. Wages average \$20 per month with board and \$30 without board. There are no changes in the acreage of farm crops.

FRANKLIN COUNTY.

Rowe (J. FRANK BROWN). — The season is backward, because of excessive rains, and planting is hardly begun. The promise for pastures and mowings never was better, and fall seeding looks well. It is too early for the fruit bloom in this locality. No insects have appeared as yet. No spraying of any account is done, and it is not increasing. Farm help is scarce, and about half of it good help. Our farmers will carry on their farms on about the old lines.

Leyden (U. T. DARLING). — The season compares favorably with the normal. Pastures are looking finely, mowings never better at this season, and fall seeding wintered well. The fruit bloom is not quite up to the average. No damage from insects as yet. Little spraying is done, but it is on the increase. Wages range from \$1 to \$1.25 per day with board and from \$1.50 to \$1.75 per day without board. The acreage of corn will be greater than usual. Farm operations are about two weeks late, because of rain.

Shelburne (G. E. TAYLOR). — The season promises to be an average one. Pastures are good, and mowings promise well; fall seeding wintered well. Apple bloom less than the average; cherries, pears and plums full bloom. No insects have appeared as yet. Not much is done in the line of spraying against insects. Farm help is plenty, and the greater part of it good. Wages range from \$14 to \$20 per month with board and are about \$1.25 per day without board. There are no marked changes in the acreage of farm crops.

Ashfield (CHAS. HOWES). — The season is later than usual, and very wet. Pastures and mowings are looking finely, and fall seeding wintered well. Pears and small fruits are blossoming full, apples sparingly. The cattle fly has made its appearance, and is the greatest insect pest at present. Spraying is practised to a limited extent. Farm help is scarce, but most of it is native and very good. Wages are about \$20 per month with board and from \$1.25 to \$1.50 per day without board. Rather more corn will be planted than usual; acreage of other farm crops about as usual.

Whately (FRANK DICKINSON). — The season is a week later than usual. Grass is a full crop, and fall seeding wintered well.

Apples made a light bloom, other fruits very full. Few insects have appeared as yet. Spraying is not practised to any extent. Farm help is plenty, but not more than one-fourth of it good. Wages range from \$15 to \$20 per month with board. The acreage of tobacco will be increased; all other crops about the same as usual.

Sunderland (J. M. J. LEGATE). — The season is a few days later than usual, with more than the average amount of rain. Pastures and mowings are looking unusually well. The fruit bloom is fully up to the average. I hear of no damage from insects so far. Very little spraying has been done, and it is not increasing. Help is plenty, and three-fourths of it can be called good help. Green help get from \$12 to \$18 per month with board, experienced help from \$18 to \$22, and day help from \$1.25 to \$1.50 per day. There is an increase in the acreage of both tobacco and onions.

Montague (C. S. RAYMOND). — The season compares very favorably with former years. The promise for pastures and mowings is uncommonly good, and fall seeding wintered well. The fruit bloom is very promising. No insects are doing damage as yet. Spraying is not practised in this section. Farm help is not very plenty, and about one-fourth of it is good help. Wages are \$20 per month with board and from \$38 to \$40 per month without board. There is very little change in the acreage of farm crops, and no new enterprises in agriculture.

New Salem (DANIEL BALLARD). — Cloudy, wet weather makes the season backward. Pastures and mowings look very promising, and fall seeding wintered well. Heavy bloom of pears and cherries, apple bloom average. There is not much damage from insects as yet. But very little spraying is done in this vicinity. Farm help is scarce, especially good help, which is never over-plenty. Wages are from \$12 to \$22 per month with board and from \$1.25 to \$1.50 per day without board. I notice no special changes in the usual line of farming.

HAMPSHIRE COUNTY.

Pelham (J. L. BREWER). — The season is promising, though late. Pastures and mowings look well, but fall seeding on moist land winter-killed to some extent. The fruit bloom is quite fair, except for peaches. No insects are doing damage at present. Very little spraying is done, and it is not increasing. Farm help is rather scarce, and half of it good help. Wages are 10 cents per hour with board and 15 cents per hour without board. There are no marked changes in the acreage of farm crops, and only occasionally something new in agriculture.

Amherst (W.M. P. BROOKS). — The season is nearly up to the average as measured by the progress of vegetation, but work is behind on wet land. Pastures and mowings promise well, and fall seeding wintered well. Peaches, pears, cherries, plums, gooseberries and currants bloomed full; apples very uneven, few Baldwins, — Greenings and some other varieties, especially early ones, abundant. No insects are unusually prominent. Spraying is followed by all large producers, and is certainly increasing. Help is about as usual as to supply and quality. First-class help get from \$20 to \$25 per month with board, less valuable help from \$10 and board upwards. Tobacco will be more largely grown than usual.

Hadley (L. W. WEST). — The season is a little late. Pastures and mowings promise well, and fall seeding is about normal in condition. Some sections show a full fruit bloom, except for apples, which have an off year. Wire and cut worms are damaging early cabbage. Spraying has not commenced, but the practice is on the increase. There is very little farm help except Polish help, which is generally good. Wages are from \$15 to \$20 per month with board and from \$1.25 to \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

Granby (GEO. A. BLISH). — The season compares favorably with the normal. Pastures and mowings are looking extra well, and fall seeding wintered well except on some low lands, where it winter-killed. The fruit bloom is quite a full one. Not very much spraying has been done, but it is on the increase. Good help is very scarce, but there is plenty of poor help. Wages average about \$20 per month with board. There is nothing new in agriculture, and no great changes in the acreage of farm crops.

Easthampton (W.M. C. CLAPP). — The season promises well, the abundant rains being what we need. Pastures and mowings are looking well, and fall seeding wintered well. There is a full bloom of nearly all kinds of fruit. Potato bugs and onion maggots are doing some damage. Not much spraying is done, as our farmers think they have not time for it. Good help is scarce, and half the supply is good. Wages are from \$16 to \$23 per month with board and from \$30 to \$35 per month without board. There will be a large acreage of tobacco, and several farmers are not planting as many potatoes as usual. One man in town is growing frogs for city markets, but has not sold any as yet.

Goshen (ALVAN BARRUS). — Excessive rains have greatly delayed plowing and planting. Pastures, mowings and fall seeding are all looking finely. The fruit bloom is not fully developed, but a light apple bloom is probable. Insects are not doing much dam-

age as yet. Spraying is looked upon favorably, but has been little practised. Farm help is very scarce, — three good, two indifferent, one bad, with proportions variable. Wages are about \$20 per month with board and from \$1.25 to \$1.50 per day without board. There is nothing marked in the way of new enterprises, except that two or three are starting in seed bean culture.

Plainfield (S. W. CLARK). — The ground is cold and wet, and but little plowing has been done, but we are still hopeful of a good season. Pastures and mowings look very well, and fall seeding wintered well. Apple trees are just beginning to bloom, normal or better; full bloom for small fruits. No insects have appeared as yet. Only a few practise spraying, and I notice no increase. Help is in fair supply, mostly Poles, who make good help after a few months. Green Poles receive \$10 per month with board, experienced help from \$18 to \$22 per month with board, and day help \$1 per day without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Chesterfield (HORATIO BISBEE). — The season compares well with the normal. Pastures and mowings are looking well, and fall seeding wintered well. Fruit trees are not yet in full bloom. No insects have appeared as yet. No spraying is done in this locality. Help is scarce this year, more so than commonly. Wages are from \$15 to \$20 per month with board and from \$1.25 to \$1.50 per day without board. No great change in the acreage of farm crops, — more corn, if anything.

Huntington (H. W. STICKNEY). — The land is very wet, and but little plowing has been done. Pastures and mowings are unusually promising, and there is a fine prospect for a hay crop. The fruit bloom was not as full as usual. No damage from insects as yet. Spraying has not been practised in this town. Farm help is plenty, and good help get good wages. Wages range from \$16 to \$18 per month with board. There will be more oats and barley sown for forage than usual.

HAMPDEN COUNTY.

Blandford (E. W. BOISE). — Grass is fully ten days in advance of the normal, all other crops from a week to two weeks late. Pastures and mowings and fall seeding are all in extra good condition. The fruit bloom is a full average for an off year. No insects of any amount have done damage to date. Very little spraying is done in this locality. Farm help is very scarce, and not over 5 per cent of it is good help. Wages are from \$20 to \$25 per month and from \$1 to \$1.25 per day with board, and from

\$1.50 to \$1.75 per day without board. There is little change in the acreage, except that more corn than usual will be planted. All farm work is fully two weeks later than usual. Farm stock is looking extra well and healthy, and dairy returns are quite satisfactory in the main.

Russell (E. D. PARKS). — The season is rather better than the average at present. Pastures and mowings are very promising, and fall seeding wintered quite well. The fruit bloom is about the same as common. Tent caterpillars and currant worms are doing some damage. Spraying is practised to some extent, and is on the increase. Farm help is rather scarce, and one-half of it is good help. Wages are from \$18 to \$20 per month with board and \$35 per month without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture. Rain has retarded plowing and planting.

West Springfield (T. A. ROGERS). — April was wet and cold, and all cultivated crops are late. Pastures and mowings look well, considering the dry season last year, and fall seeding wintered well. Pears, plums, cherries and peaches made a good bloom; apple bloom scattering. Tent caterpillars are quite thick. Spraying has been practised but little, but is on the increase. There is no trouble in getting farm help, but not much of it is extra good. Wages average \$20 per month with board and from \$1.25 to \$1.50 per day without board. There are few changes in the acreage of farm crops and nothing new to speak of in agriculture.

Agawam (R. DEWITT). — The season is a little late, but is fast catching up. Mowings look fairly well, and early sown fall seeding wintered well. The fruit bloom is a good average. Currant worms and potato bugs are doing some damage. Spraying is practised to a small extent, and is perhaps gaining a little. There is enough help, such as it is. Wages are from \$15 to \$20 per month with board. There will be a little increase in the acreage of tobacco and potatoes, and perhaps a slight decrease in that of corn.

Ludlow (C. B. BENNETT). — The season is about one week late. Pastures and mowings never looked better, and fall seeding looks fairly well. No bloom on Baldwin apples, a full bloom of other varieties; pears, plums, peaches and cherries very full. Tent caterpillars are quite plenty. Spraying is little practised, but is slightly on the increase. Farm help is very scarce, and about one-fourth of it is good help. Wages average \$20 per month with board and from \$30 to \$35 without board. More corn than usual is being planted, acreage of other crops about the same as usual.

Wilbraham (F. E. CLARK). — The season is fully two weeks late, and has been cold and wet, but favorable for grass and winter grains. Pastures and mowings are looking well. Apples made a 50 per cent bloom; pears, cherries, peaches and berries, 100 per cent. As yet no insects have appeared to trouble us. Perhaps half of our orchards are sprayed, and spraying is on the increase. Farm help is scarce, especially good help, not more than one-fourth of the supply being good help such as we had forty or fifty years ago. Wages range from \$15 to \$25 per month with board and from \$25 to \$40 per month without board. No marked change in the acreage of farm crops, but several thousand peach trees have been set this spring.

Monson (A. H. WHITE). — The present season is rather late and quite wet. Feed in pastures is starting well, and grass in mowings is doing well. The fruit bloom is about normal. No insects have appeared as yet. Not very much spraying is done here. Farm help is plenty, and all of it is comparatively good. Wages range from \$15 to \$20 per month with board and from \$1.25 to \$1.50 per day without board. There is no change in the acreage of the usual farm crops.

Palmer (O. P. ALLEN). — The season is unusually cool and late. Pastures and mowings promise well. Early fruit trees have been very full in bloom, while apple trees have not yet blossomed much. Insects have not been much in evidence as yet. Spraying is practised in only a limited way in this vicinity. Farm help is rather scarce, especially good help. Wages average about \$18 per month with board and \$1.50 per day without board. There have been no marked changes in the acreage of farm crops.

WORCESTER COUNTY.

Brookfield (F. E. PROUTY). — The season is wet and somewhat backward. The promise for pastures and mowings is good, and fall seeding wintered quite well. The apple bloom was lighter than last year, that of pears good. No insects doing damage as yet. Spraying is practised to a small extent, but is on the increase. Farm help is fairly plenty, and about one-fifth of it is good help. Wages average about \$20 per month with board and about \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

New Braintree (C. D. SAGE). — The season is about as forward as usual, and gives excellent promise. Pastures and mowings are looking well, and fall seeding wintered fairly. Some orchards show quite a full bloom, others a light one. Tent caterpillars are

doing some damage. Very little spraying is done. Farm help was never more scarce, and good help is hard to find at any price. Wages range from \$15 to \$25 per month with board and average about \$35 per month without board. More corn and fodder corn have been planted than usual.

Hubbardston (C. C. COLBY). — The season is very backward, and very little planting has been done. Grass is looking well, with the promise of an extra crop. Fruit trees are now in full bloom. Very little spraying has been done in former years, but more will be done this season. Farm help is hard to get, especially good help. Wages range from \$15 to \$26 per month with board and from \$1.25 to \$1.50 per day without board. Several new silos will be built, and a large acreage of corn planted.

Templeton (LUCIEN GOVE). — The season opened some ten days later than usual, but conditions are better than for two years. Pastures and mowings are in good condition, and but very little fall seeding winter-killed. Cherries, plums and pears made a full bloom; apple bloom light for Baldwins, other kinds a fair average. Cut worms and asparagus beetles are doing some damage. A few spray their fruit trees, but the increase, if any, is slight. Farm help is scarce, and 25 per cent is all that can be called good. Wages are from \$15 to \$25 per month with board and from \$1.25 to \$1.50 per day without board. There is a growing tendency towards raising more forage crops, the hay crop being so uncertain.

Royalston (C. A. STIMSON). — The season is cold, wet and backward. The weather has been ideal for pastures and mowings, and fall seeding wintered fairly well. Pears and cherries made a full bloom, apples very light. No insects have appeared as yet. No spraying to speak of is done, and the practice is not increasing. Farm help is scarce, and one-fourth of it is good help. Wages average \$18 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Fitchburg (JABEZ FISHER). — The temperature has been about normal for the season, and the rainfall much above. The promise for pastures and mowings could not be better. The apple bloom is moderate, no Baldwins on trees that bore last year; pears the finest in my recollection, other fruits full; raspberries and blackberries injured by the winter weather. Currant worms are doing some damage, other insects not troublesome as yet. There is no especial change as regards spraying; last year's full crop and freedom from insects and fungi will have a tendency to decrease it. The best quality of help is scarce, and that which is plenty is not first class. Wages are from \$15 to \$25 per month with board

and from \$1.25 to \$1.50 per day of ten hours without board. The apple bloom occurred one day later than the average of forty-five years.

Bolton (H. F. HAYNES). — The season has been so wet that little progress has been made with farm operations. Mowing and pastures never looked better, and fall seeding wintered well. The fruit bloom was a good one for the off year. Tent caterpillars are our most troublesome insect. Spraying is increasing, but only a small part of the trees are sprayed as yet. There is no farm help to be had; I have never known it to be so scarce. Good help receive \$20 per month with board and \$1.50 per day without board. There will not be nearly as great an acreage of farm crops as usual, as the ground is still too wet to plant.

Harvard (J. S. PRESTON). — The season is very late, owing to wet weather, and very little planting has been done as yet. Pastures and mowings are better than usual, and fall seeding wintered well. The bloom is light for most fruit. Tent caterpillars are very plenty and we have the elm beetle with us. Not very much spraying is done, but the practice is on the increase. Native help is scarce, and about half the supply is very good. Wages are about \$20 per month with board and from \$1.50 to \$1.75 per day without board. There is about the usual acreage of farm crops, and no new enterprises in agriculture.

Northborough (J. K. MILLS). — The season is the most backward for some years. Pastures and mowings are looking extra well. There is a full bloom on all small fruits; apples half a full bloom. No insects have appeared as yet. Nearly all our farmers spray their fruit trees, and the practice is increasing. Farm help is scarce, and it is almost impossible to get good help. Wages are from \$15 to \$25 per month with board and from \$1.25 to \$1.75 per day without board. There will be an increased acreage of corn, other crops about as usual.

Worcester (S. A. BURGESS). — The season is a favorable one, although excessive rains have caused delay in planting on low lands. Pastures and mowings are in good condition, and fall seeding wintered well. The fruit bloom was a full one, with exception of winter apples, which made a light bloom. Insects are not doing much damage. Spraying is practised to a limited extent, and is increasing. Farm help is scarce, and half of it good. Wages are \$25 per month with board and \$1.50 per day without board. Wealthy manufacturers are purchasing extensive tracts of land for cultivation and improvement.

Spencer (H. H. KINGSBURY). — The season is decidedly backward at present. Cool weather, with an abundance of rain, has

been very favorable to grass. The apple bloom is about half the normal; other kinds of fruit gave a full bloom. The tent caterpillar is the only harmful insect as yet. There is no spraying of fruit trees in this town. There has been a noticeable scarcity of help for farm work. Wages are \$20 per month with board and \$1.50 per day without board. I know of no new methods to be pursued or changes in farming the present season.

Uxbridge (AUGUSTUS STORY). — The season is not up to the normal, and planting is three weeks late. Pastures and mowings promise finely, and fall seeding looks well. The fruit bloom is fully up to former years. No insects are doing damage worth speaking of. Not much spraying is done here. Farm help is scarce, and not one in six good help. Wages are from \$12 to \$18 per month with board and from \$20 to \$25 per month without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON). — The season is a late one, agriculturally speaking. Pastures and mowings are in good condition, and fall seeding wintered well. The fruit bloom was full for an off year. Canker worms are doing some damage. Spraying against insects attacking fruit is not much practised. Farm help is scarce. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Marlborough (E. D. HOWE). — The season is from two to three weeks late, on account of excessive rain. Pastures and mowings are in excellent condition. No winter apples, all other fruit a full bloom. Currant worms and tent caterpillars are the only insects noticed as yet. About half our farmers spray, but the practice is not increasing. There is plenty of farm help, and two-thirds of it is good help. Wages are from \$20 to \$25 per month with board and from \$1.25 to \$2, mostly \$1.75, per day without board. Wet fields will necessitate some modification of the usual acreages of farm crops.

Maynard (L. H. MAYNARD). — I should say the season was about two weeks late. Pastures and mowings look unusually well, and fall seeding wintered well. Apples made about half a full bloom, other fruits more than an average. The asparagus beetle is doing some damage. Spraying of fruit trees is practised to a considerable extent, and is on the increase. Good farm help is scarce. Wages are from \$20 to \$25 per month with board and from \$1 to \$1.50 per day without board. There are no marked

changes in the acreage of farm crops, though that of asparagus seems to be on the increase.

Littleton (G. W. SANDERSON).—The season compares very favorably with the normal. Pastures and mowings are looking well, and fall seeding wintered well, except where injured by the very dry weather of last fall. Apples did not make a full bloom; pear bloom large. Tent caterpillars are doing some damage. At the present time there is not as much spraying in progress as in former years. Ordinary help is plenty, but not more than half our help can be called good. Wages are from \$22 to \$30 per month with board and from \$12 to \$14 higher without board. More silos are to be built this year than any year heretofore.

Ashby (ANSON WETHERBEE).—The season is later than usual by a week. Pastures and mowings look better than for some time. There is but little apple bloom in this section, owing to the ice breaking the trees badly in November last. A few tent caterpillars are our only insects. Not as much spraying will be done this year as in a bearing year. Farm help is scarce, and half of it is good help. Wages are from \$20 to \$25 per month with board and from \$1.25 to \$1.50 per day without board.

Dunstable (A. J. GILSON).—In some respects the season is more backward than usual. Pastures and new mowings promise well, and fall seeding wintered well. The fruit bloom is rather above the normal. No complaint in regard to insects at this time. Spraying is but little practised, and I do not think it is on the increase. Good farm help is scarce, and second-quality help not very plenty. Wages are from \$18 to \$20 per month with board and from \$30 to \$32 per month without board. There are no marked changes in the acreage of the main farm crops, and no new enterprises in agriculture.

Chelmsford (P. P. PERHAM).—The present season is some two weeks later than the average. Pastures never looked better at this season of the year. The fruit bloom is very light, and winter apples will be a light crop. The season is so cold and backward that insects are doing very little damage. Spraying is practised to a limited extent, but is not on the increase. Good farm help is not plenty, and not more than one-third the supply would be called good. Wages average \$20 per month with board and from \$30 to \$35 per month without board. There are no marked changes in the acreage of the usual farm crops.

Bedford (HENRY WOOD).—The season is very wet, low land being particularly moist. Pastures and mowings are in good condition, but fall seeding winter-killed considerably. The fruit bloom is about half that of last year. Tent caterpillars are the only

insect doing damage as yet. Spraying is on the increase. Only a small proportion of our farm help is good help. Wages are from \$15 to \$20 per month with board and from \$1.50 to \$1.75 per day without board. There is no change in the acreage of the usual farm crops, although many strawberry plants are being set out this spring.

Winchester (MARSHALL SYMMES). — The season has been so wet that many pieces of ground cannot be plowed even yet, so it would seem that early crops will be short. Pastures and mowings are in the very best of condition, and fall seeding mostly wintered well. Enormous quantities of blossoms on peach, plum, cherry, pear and apple trees. Not many insects in sight yet. Spraying is on the increase. Plenty of men looking for work, but not many take kindly to farming. Wages are from \$15 to \$20 per month with board and from \$7.50 to \$10 per week without board.

Newton (OTIS PETTEE). — But little work has been done as yet, because of the cold, wet weather. Grass in pastures and mowings has set thick, and if wet weather continues there is the prospect of a good crop. The fruit bloom is a fair average of former years. Very few insects have appeared as yet. There will be no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

ESSEX COUNTY.

Salisbury (WESLEY PETTENGILL). — The season has been very cold and wet, and everything except grass is backward. Pastures and mowings are looking well except on high ground, where they were severely injured by the drought of last summer. Baldwins will give light bloom, other apples good; pears and plums in full bloom. Tent caterpillars are doing some damage, but are not as plenty as some years. Spraying is practised for canker worms, and not much for other insects. Farm help is a little scarce this spring, and not over 20 per cent of it is good help. Wages range from \$15 to \$25 per month with board and from \$25 to \$35 per month without board; by the day, \$1 with board and \$1.50 without. The acreage of planted crops will not be as large as usual, owing to the lateness of the season.

Haverhill (EBEN WEBSTER). — The season has been cold and wet, and not much has been done on low land. Pastures, mowings and fall seeding are looking well. The fruit bloom is smaller than last year, Baldwin apples very light, fall apples full bloom. No insects as yet. Spraying is rather on the increase. Good farm help is not plenty. Wages average about \$20 per month with board and \$1.50 per day without board. There is nothing new in agricultural enterprises or the acreage of farm crops.

Newbury (G. W. ADAMS). — The season is about two weeks late. The prospect for pastures and mowings is good, and fall seeding wintered well. The fruit bloom appears to be nearly an average. Canker worms and tent caterpillars are doing some damage. One-eighth of our farmers spray with a slight increase from year to year. Farm help is scarce, and perhaps 2 per cent is good help. Wages are from \$16 to \$26 per month with board and \$1.50 per day of a scant ten hours without board. Some crops will be abandoned this year, on account of the late season and wet ground.

Manchester (JOHN BAKER). — The season is very backward. Pastures and mowings promise very well, and fall seeding wintered well. The fruit bloom is a good average. It is too wet and cold for insects to work much havoc as yet. The practice of spraying is on the increase. Farm help is quite plenty and from one-half to two-thirds of it is good help. Wages average \$25 per month with board and \$1.75 per day without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Topsfield (B. P. PIKE). — The season promises as well as usual. Fall seeding is all right, and pastures and mowings were never in better condition. Pears and plums made a full bloom, very few winter apples, some fall apples, no peaches. No insects are doing damage as yet. There is not much spraying, except for canker worms. Farm help is scarce, and one-fourth of it is good help. Wages are about \$20 per month with board and \$1.50 per day without board. There is not much change in the acreage of farm crops, and most of our farmers make milk.

NORFOLK COUNTY.

Cohasset (E. E. ELLMS). — The season is more favorable than usual. Fall seeding wintered well, and the promise for pastures and mowings was never better. The fruit bloom was fuller than usual. No insects doing damage as yet. Spraying is not practised to any great extent. Farm help is very scarce, and hardly any of it good. Wages average \$28 per month with board and \$45 per month without board. There are no changes in the acreage of farm crops of any account.

Stoughton (C. F. CURTIS). — The season is about two weeks late. Pastures and mowings are looking as well as they ever did, and most fall seeding wintered well. The fruit bloom is not far enough advanced for a comparison with former years. No insects have appeared as yet. Very little spraying is done, but should say that it is increasing slowly. Farm help is scarce,

and good help about one in ten. Wages average \$20 per month with board and \$1 per day without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Canton (E. V. KINSLEY). — The season is later than the normal, but promising. Pastures and mowings look finely, and fall seeding wintered well. Apples made a normal bloom; pears, peaches, plums and cherries a very full bloom. No noxious insects have made their appearance. Not much spraying is done, though some interest in the process is manifested. Farm help is not plenty, and there is very little good help. Wages are from \$15 to \$25 per month with board and from \$1.25 to \$1.50 per day without board. Dairying for milk to supply family trade is constantly increasing.

Medfield (GEO. R. CHASE). — The season is good for grass, but other crops are backward. Pastures and mowings are in good condition, and fall seeding wintered well. The fruit bloom was very abundant, except for apples. Spraying is practised but little, and is possibly increasing slightly. Farm help is scarce, and one-third of it is good help. Wages are from \$18 to \$22 per month with board and about \$40 per month without board. The acreage of corn will be increased about 10 per cent.

Millis (E. F. RICHARDSON). — The season is late and wet. Pastures and mowings are in good condition, and fall seeding wintered well. The fruit bloom is much lighter than usual. Insects have not appeared as yet. Spraying is practised to quite an extent, and is on the increase. Good farm help is scarce. Wages range from \$17 to \$24 per month with board and average \$1.50 per day without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Franklin (C. M. ALLEN). — The season promises fairly well at present. The dry weather of last summer will make mowings thin, although the spring has been excellent for them; fall seeding wintered well. Apples made a very light bloom, all other fruits very good. No insects have appeared as yet. Only a few spray their fruit trees, but the practice is increasing. Farm help is plenty, but none of it is good without an overseer. Wages range from \$15 to \$22 per month with board and are about \$1.50 per day without board. There are no marked changes in the acreage of farm crops.

BRISTOL COUNTY.

Attleborough (ISAAC ALGER). — The season is above the average, agriculturally speaking. Pastures and mowings never looked better. Apples made a small bloom, pears average, plums full,

cherries very full. Insects are not doing much damage as yet. There is practically no spraying done. Farm help is scarce, and fairly good. Wages average \$20 per month with board and \$1.50 per day without board. There is no change in the acreage of farm crops.

Mansfield (Wm. C. WINTER).—The season is late, and crops will generally be a week later than usual. Pastures and mowings are in excellent condition, and fall seeding wintered well. The fruit bloom was a full average, except for peaches. Insects have done no damage thus far. Comparatively little spraying is done, but it is on the increase. There is enough good farm help for our needs. Wages average \$18 per month with board and \$36 per month without board. Very little change is apparent in the acreage of farm crops; cucumber raising in hothouses is being entered into by a number.

Raynham (N. W. SHAW).—The season is favorable, though late. Fall seeding winter-killed, but mowings are looking well. The fruit bloom was a good average. Currant worms are doing some damage. Very little spraying is done here. Farm help is scarce, and only a small part of it is good help. Wages average \$18 per month with board and \$1.25 per day without board. A smaller acreage of farm crops than usual will be put in, owing to the late season and the scarcity of help.

Swansea (F. G. ARNOLD).—The season has been very wet, and spring work is very much behind. Pastures and mowings look well, and fall seeding wintered well. The fruit bloom was very heavy. No insects have appeared up to the present time. Spraying is practised but little. Farm help is rather plenty, though but little of it can be called competent. Wages range from \$18 to \$22 per month with board, from \$30 to \$35 per month without board and from \$1.25 to \$1.50 per day without board. Less potatoes than usual will be planted and more corn and forage crops.

Acushnet (M. S. DOUGLAS).—The season has been cold and wet, and is fully ten days late. Pastures were never in better condition, and the hay crop promises well. Full bloom for all fruit except apples, peaches unusually heavy. Tent caterpillars are very plenty. Farmers are seeing the necessity of spraying, and it is on the increase, but not much is done as yet. Farm help is scarce, and not over half of it is good help. Wages are from \$18 to \$20 per month with board and about \$1.50 per day without board. Farmers in this section are engaged in market-gardening.

Dartmouth (L. T. DAVIS).—The season is very backward. Pastures and mowings look well, and fall seeding wintered fairly.

The fruit bloom was quite full in most cases. It is too wet and cold for insects at present. Very little spraying is done. There is about a normal supply of help, of the usual quality. Wages range from \$15 to \$20 per month with board and from \$1.25 to \$1.50 per day without board. There will be no great change in the acreage of farm crops though there may have to be some changes because of excessive moisture.

PLYMOUTH COUNTY.

Brockton (DAVIS COPELAND).—The season is about three weeks later than usual. Pastures and mowings promise well, and fall seeding wintered well. It is too early to judge as to the fruit bloom. Green flies on cattle are causing some trouble. Spraying is not practised to any extent. Farm help is scarce, and about half of it is good help. Wages average \$20 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Marshfield (J. H. BOURNE).—There has been less sunshine and more rain than usual, and the season is late. Pastures and mowings are in excellent condition, and fall seeding looks well. Pears and peaches made a full bloom; apple trees not out yet, but promise well. Tent caterpillars are building their tents. Spraying is not largely practised, and is not increasing much. Farm help is rather less plenty than usual, with one-third of it good. Wages are from \$18 to \$20 per month with board and \$1.50 per day without board. There has been quite an extensive planting of peach trees, currants and strawberries.

Hanson (F. S. THOMAS).—The season is late and wet. Pastures and mowings are in good condition, and fall seeding wintered well. Late apples made a poor bloom; early apples, pears and plums good; peaches poor. There are a good many tent caterpillars in evidence. Spraying against insects attacking fruit is practised very little. Farm help is scarce, but what there is is good help, as a rule. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Plympton (WINTHROP FILLEBROWN).—The season is as early as usual, with an excess of rain. All grass is in excellent condition, and fall seeding is above the average. The fruit bloom is as good as possible. Tent caterpillars seem to promise considerable damage later on. Spraying is practised by only a few, and is not on the increase. There is not an excess of help, but our local supply is of excellent quality. Wages range from \$15 to \$25 per month with board and \$1.50 per day of ten hours without board.

There will be little change in the acreage of farm crops, but poultry raising is steadily on the increase, and several new cranberry bogs have been made the past year.

Lakeville (N. G. STAPLES).—The season has been very wet and backward. Grass is looking very well on high land, but low land is too wet; fall seeding wintered well. Apple bloom about one-third, pears full, no peaches. We have been free from insects thus far. Very little spraying is done. Farm help is very scarce. Wages average \$18 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Carver (J. A. VAUGHAN).—The ground is very wet, and farmers are late in planting. The promise for pastures and mowings is excellent. There was a full fruit bloom. No insects have appeared as yet. Spraying is practised to only a small extent, but is increasing. Wages average \$18 per month with board and \$1.50 per day without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

BARNSTABLE COUNTY.

Bourne (D. D. NYE).—The season compares fairly well with the normal. Pastures and mowings promise finely, but fall seeding winter-killed badly. The fruit bloom was not as full as last year. No insects have appeared as yet. Spraying is practised to a small extent. Farm help is very scarce, half of it being good help. Wages average \$20 per month with board and from \$30 to \$35 per month without board. There are no changes in the acreage of farm crops, and no new enterprises in agriculture.

Mashpee (W. F. HAMMOND).—The season is rather below the average in promise at present. Pastures and mowings are looking well, and fall seeding wintered well. Fruit trees bloomed full, except apple trees, and strawberries are setting very full. Tent caterpillars and onion maggots are doing some damage. There is very little spraying done, but it is on the increase. Farm help is plenty, and three-fourths of it is good help. Wages average \$18 per month with board and \$28 per month without board. There will be an increased acreage of corn.

Dennis (JOSHUA CROWELL).—The season is about ten days late. Pastures and mowings are in excellent condition. The fruit bloom is a full average. Tent caterpillars are doing some damage. Very little spraying is done, except on cranberry bogs, but the practice is increasing. Farm help is plenty, and half of it is good help. Wages average \$25 per month with board and \$1.50 per day with-

out board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

Harwich (A. N. DOANE). — The season has been cold and wet. Grass land is in good condition. The fruit bloom was not as good as last year. Cut worms are doing some damage. Spraying is increasing yearly. Farm help is in fair supply, and of good quality. Wages average \$20 per month with board and \$1.50 per day without board. There has been no marked change in the acreage of farm crops. We are now letting the water off the cranberry bogs. Those bogs which have been without water have been badly damaged by the severe cold weather.

Eastham (J. A. CLARK). — The season is about a week later than the average. Pastures and mowings were never in better condition. Pears made a full bloom, but it is too early to say as regards apples. No insects are very troublesome as yet. Spraying is practised to some extent, and is on the increase. There is help enough for the demand, and it is fairly good. Wages range from \$10 to \$25 per month with board. Farmers in this section are largely engaged in asparagus culture, but there seems to be an increase in small fruit and strawberries.

Truro (D. E. Paine). — The season promises fairly well. Pastures and mowings are in excellent condition, and fall seeding wintered well. The fruit bloom is very backward. No insects have appeared as yet. Spraying is but little practised. Farm help is plenty, and most of it is good. Wages average \$20 per month with board and \$30 per month without board. There are no marked changes in the acreage of farm crops, and no new enterprises in agriculture.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — The season is very much later than usual, on account of the cold wet weather. Pastures and mowings promise well. It is too early for fruit bloom with us. No insects have appeared as yet. Spraying is practised to some extent, and is increasing slowly. The supply of farm help is about equal to the demand, and about one in five is good help. Wages are about \$20 per month with board and \$1.50 per day without board. There have been no marked changes in the acreage of farm crops. Two hop farms have been started on our plain land.

BULLETIN OF
MASSACHUSETTS BOARD OF AGRICULTURE.

THREE COMMON ORCHARD SCALES.

By Prof. H. T. FERNALD, *Professor of Entomology, Massachusetts Agricultural College.*

Our knowledge of scale insects has been very limited until recently. The injuries they cause have passed unnoticed in most cases, while the occasional loss of some tree has too often been attributed to some other cause. The appearance of the San José scale in Massachusetts, however, and its rapid extension over the State, followed everywhere by serious injury to the trees attacked, has attracted much attention to this group of insects.

Although over a hundred different kinds of scale insects probably occur in Massachusetts, only three are likely to be present in any orchard in sufficient abundance to cause injury to the trees and demand attention, and only one of these is usually so destructive as to require radical measures for its control. These three are the oyster-shell scale, the scurfy scale and the San José scale. It is important that every person having fruit trees should learn to recognize these three scales, and know what treatment to apply for each if he wishes to obtain his crops, or, in case of the San José scale, if he wishes even to keep his trees alive.

THE OYSTER-SHELL SCALE.

(*Mytilaspis pomorum* Bouché.)

This scale is a native of Europe, and reached this country, where it is now generally distributed, about a hundred years ago. It is probably present in every orchard in Massachusetts in greater or less numbers, and is also abundant on many of our shade and forest trees.

During the winter the scales of this insect are very noticeable on the twigs and smaller branches of many trees, often completely covering them. The scale is about one-eighth of an inch long, quite pointed at one end, rounded at the other, and usually somewhat curved to one side (Fig. 1) so that in general outline it somewhat resembles an oyster shell. Its color is dark reddish

or grayish brown. If one of these scales be lifted, and its under side examined under a microscope, from twenty to a hundred whitish or yellowish eggs will be found, while under the pointed end are the remains of the parent insect which produced the scale.

The eggs hatch in Massachusetts about the 10th of June, the exact time varying with the nature of the season, and the little

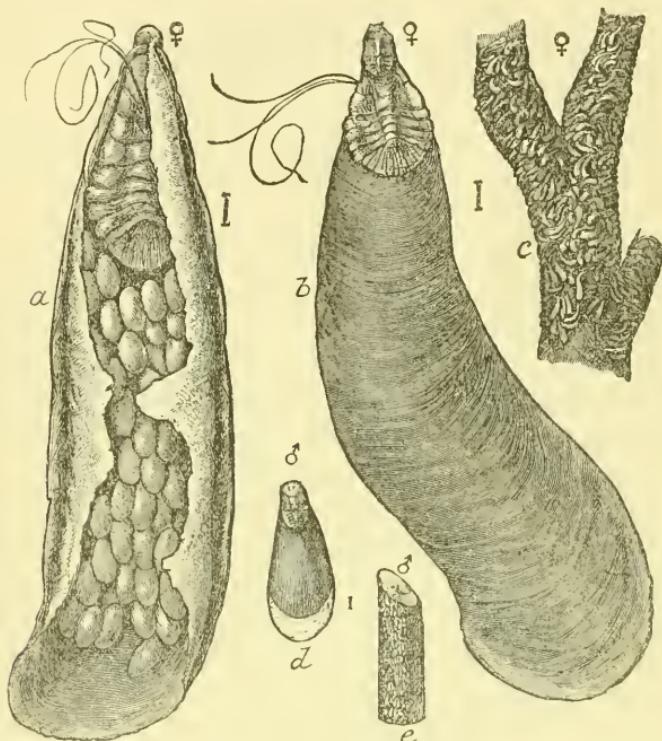


FIG. 1.—Oyster-shell scale: *a*, under side of female scale, showing eggs; *b*, upper side of same, both much enlarged; *c*, female scales on a branch, natural size; *d*, male scale, much enlarged; *e*, male scales on branch, natural size. The fine lines to the right of *a*, *b* and *d* show the real length of the scales. (Howard, U. S. Dept. Agr., Yearbook, 1894.)

yellowish young escape from under the scale and crawl about over the twigs, seeking for places to locate. After a few days they settle down, push their sharp beaks through the bark and begin to suck the sap from the tree. Here they remain, and gradually cover themselves with scales as a protection. In the fall the eggs are laid under the hinder part of the scale and the parent dies, leaving its scale as a covering during the winter for its eggs, which hatch the following spring. The male scales are smaller and of a slightly different form from the female scales, as shown in Fig. 1.

This insect is found on a large number of food plants, the more important ones being the apple, pear, plum, quince, lilac, ash, poplar, willow, elm, maple, raspberry, currant and rose.

THE SCURFY SCALE.

(Chionaspis furfura Fitch.)

The scurfy scale, probably a native of this country, is generally abundant over the eastern United States, but is most plentiful south of New England.

The scale itself is somewhat smaller than that of the oyster-shell scale, and is usually broader in proportion to its length. One end is somewhat pointed, while the other is irregularly

rounded, the general color being a dirty white, which makes it quite noticeable (Fig. 2, *a* and *c*).

The scales of the male (Fig. 2, *b* and *d*) differ from those of the female above described in form, and are also smaller.

The habits of this scale are similar to those of the oyster-shell scale, the winter being passed in the egg stage. The ten to seventy-five eggs which may be found under the female scale hatch in June, and the purplish young crawl

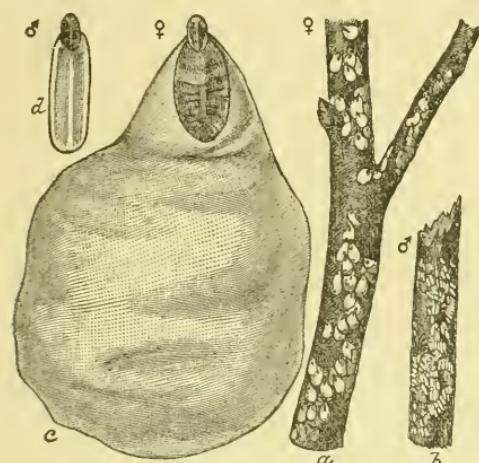


FIG. 2.—Scurfy scale: *a*, female, *b*, male scales, natural size on twigs; *c*, female scales, much enlarged; *d*, male scale, much enlarged. (Howard, U. S. Dept. Agr., Yearbook, 1894.)

about for a few days, after which they settle down to feed. The remainder of the life history is much the same as that of the oyster-shell scale.

The scurfy scale is found on the apple, crab-apple, pear, peach, cherry, quince, Japan quince, currant, mountain ash and many other plants.

Treatment for the Oyster-shell and Scurfy Scales.

The treatment for these two scales is comparatively simple. As there is but one brood of young each year, the infested trees or plants should be sprayed soon after the young hatch from the egg; this will be some time in June, varying with the season. The material used for spraying may be either kerosene emulsion or a mechanical mixture of kerosene and water. If kerosene emulsion be used, it should be prepared as follows: hard soap, shaved fine, one-half pound; water, one gallon; kerosene, two gallons. Dissolve the soap in the water, which should be boiling; then remove

from the fire, and while hot pour it into the kerosene. Churn this with a spray pump till it changes, first into a creamy, then into a soft, butter-like mass. For use, take one part of this prepared emulsion and thoroughly mix with nine parts of soft water by churning it back into the pail, or whatever it may be in, through the spray pump until it is thoroughly mixed, then apply to the tree. This treatment in ordinary seasons should be made about the 15th of June, and a second one ten days or two weeks later.

If the mechanical mixture be used instead, a special pump, having two tanks, such as the "Kerowater," should be used, the pump being adjusted so as to mix five per cent of the kerosene with ninety-five per cent of water. The time of the treatments should be the same as when kerosene emulsion is used.

THE SAN JOSÉ SCALE.

(*Aspidiotus perniciosus* Comst.)

This most serious of scale insects was first discovered in this country in California, about 1870. It is probable that Japan is its native home, as it has several times been received from there on imported stock. In 1893 it appeared in Virginia, where it seems to have been received from New Jersey. An investigation in the latter State led to the discovery that two nurseries there had about the year 1886 or 1887 introduced the "Kelsey" plum from California, in the hope that it might be proof against the attacks of the cureulio. The trees thus obtained did not thrive (probably because they were infested by this scale), and were ultimately destroyed, but presumably not until the insect had spread from them to other nursery stock. As both of these nurseries did a large business, the scale was in this way scattered all over the eastern and middle States before the danger was realized. As many of the places to which the infested stock was sent were nurseries, these in turn became infested, with the result that the San José scale is now present in nearly every one of the United States, as well as in Canada and other foreign countries.

Life History.

The insect passes the winter under the scale, but it is probable that both the adult and the very young insects die during this period. In the spring those which are alive resume their feeding and become full grown about the first or middle of June. The production of young soon follows, these being born alive. When the young first appear they are extremely minute, yellowish in color, and with six legs. They crawl away from the parent scale and move about for a day or two, then settle down, and, inserting

their beaks into the bark, begin to suck the sap from the tree. About this time little waxy threads develop on the surface of the body, and soon fuse together to form the first portion of the covering scale. When this is completed, the scale is white, nearly circular in outline, and with a little hump or nipple in the centre. About ten days later the insect molts its outer shell and adds this to the covering scale, which by this time has become dark gray, except the central nipple, which is lighter colored, often yellow. About ten days later the female insect molts again, and, as before, adds the molted skin to the covering scale, thus making it larger than those of the males, which do not undergo a second molt.

Soon after molting the second time the females become mature and begin to produce young, "averaging ten a day for more than a month." Each of these young develops as just described for the parent, and those produced first have begun to produce young in their turn before their parent has completed the same process.

As a result, young, crawling forms may be found at almost all times from the last of June until frosts appear in the fall, during which time it has been calculated that the progeny of a single female may number 1,608,040,200, all of which have obtained their nourishment from the plant they are on. With a power of increase as rapid as this, it is not strange that trees suffer severely and often die in a short time after being attacked by this pest.

Food Plants.

The San José scale feeds upon nearly all our plants, shrubs and trees, except evergreens. Its more usual food plants, however, appear to be the pear, peach, plum, cherry, strawberry, raspberry, blackberry, gooseberry, currant, grape, rose, osage orange, elm, maple, chestnut, oak, birch, willow and Japanese plants. It attacks trunk, branches, twigs, leaves, and even the fruit; and during the year 1900, currants, pears and apples, grown in Massachusetts, were received so covered by these insects as to render them unsalable.

Distribution in Massachusetts.

This scale was first discovered in Massachusetts in 1895. Since that time it has appeared in a large number of places in the State, probably introduced on stock purchased from infested nurseries, and it is now known to occur in the following places: Amherst, Attleborough Falls, Auburndale, Bedford, Belchertown, Beverly, Billerica, Boston, Brookline, Danvers, Dighton, Dracut, Everett, Greenwood, Groveland, Holyoke, Jamaica Plain, Leominster, Lunenberg, Malden, Middleborough, Millville, Natick, Newtonville, North Abington, North Attleborough, North Cambridge,

Norwood Central, Reading, Revere, Roslindale, Russell, Salem, Saxonville, Scituate, Somerville, South Framingham, South Chelmsford, Swampscott, Taunton, Three Rivers, Townsend, Winchester and Worcester. It is probable that in addition to these forty-four places it is present in as many more, existing unrecognized and perhaps unnoticed.

How the Scale spreads.

The most important way in which the scale spreads is, as has already been shown, by its conveyance upon nursery stock. Its spread from tree to tree, however, occurs by means of the crawling young. These are very small, and may easily be blown off the tree they are on by sudden gusts of wind, and, if carried to another tree, or even very near it, may be able to establish themselves. Others crawl onto the feet of birds or even other insects as these rest on infested trees, and when they fly to other trees may crawl off there. If the branches of adjacent trees touch, the young may crawl directly from one to another.

Enemies.

The San José scale is not without its enemies, which prey upon it. Chief among these are the lady-birds, or lady-bugs, as they are commonly called, perhaps the most common one which feeds upon the scale being the "Twice-stabbed lady-bug," which is a small, shining black beetle, about an eighth of an inch long and nearly as wide, with its upper surface very strongly convex, and with two dark-red or orange spots on the back. This insect is of much aid in the destruction of the scale, but unfortunately its rate of increase is so much less than that of the scale that it is unable to do more than somewhat reduce the numbers of the pest.

There are several parasites of the scale, as well, but here, too, their rate of increase is less rapid than that of the scale, which of course renders their work of less value than would otherwise be the case.

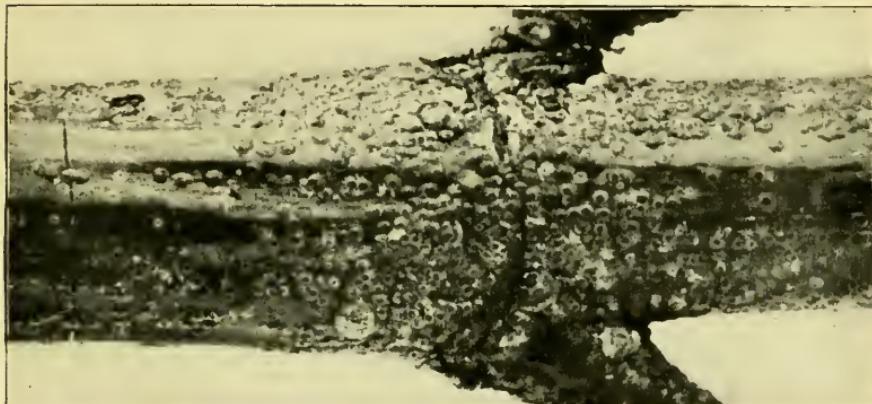
A fungus occurs in the southern States which also attacks the scale, and this has been cultivated somewhat, in the hope that it might be made use of in controlling the insect. Thus far, however, these hopes have failed to be realized. In fact, all of these enemies together fail to do more than to somewhat check the rapid increase of the scale, which, when present, requires treatment by man in addition, if the infested plants are to be kept from entire destruction.

Treatment.

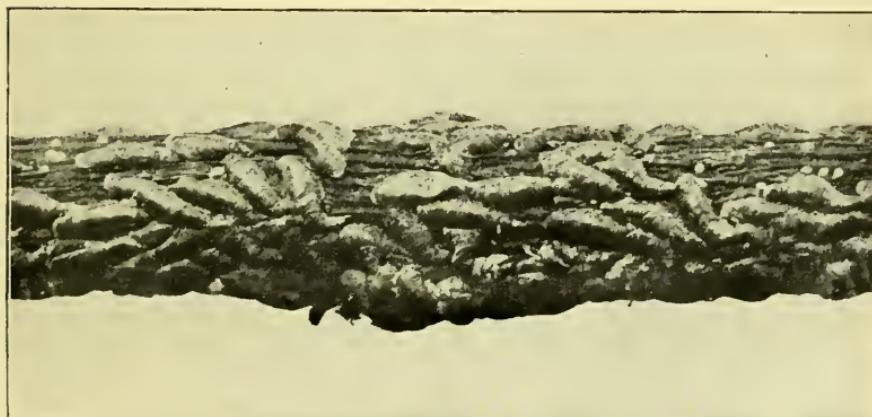
The methods of treatment for the San José scale successfully used on the Pacific coast have thus far failed in the eastern United



The Scurfy Scale.



The San José Scale.



The Oyster-shell Scale.

THREE COMMON ORCHARD SCALES.—Twice Natural Size.

States, where they are "fatal to only a small percentage of scales." Why this is the case it is difficult to say. In California the treatment is applied some little time before the rainy season, which gives an opportunity for its action before being washed off by the rains. In the east, however, this treatment must be applied at times when rains are frequent, and it may be that in this fact is found the reason why the treatment is a failure in this part of the country.

The San José scale is a sucking insect; consequently, neither Paris green, arsenate of lead or any of the so-called "stomach poisons" are of the slightest use. The treatment which will kill it must be something which kills by coming in contact with it; and, as the insect, except in its earliest stages, is covered by a hard scale, the treatment must be by the application of some substance caustic enough to eat or corrode the scale and penetrate to the body of the insect beneath. Spraying with kerosene emulsion will kill the young insects, of course; but, as these appear every few days from some time in June until November or even December in some cases, this would mean that the infested trees must be sprayed at least once a week during this entire time, which is also the time during which it is most difficult to reach all parts of the tree thoroughly, on account of the foliage. Accordingly, treatment during the winter months is the best.

Destruction of Trees infested.

In cases where the scale has just appeared, or but few trees are infested, the cheapest and safest treatment is to cut down and burn those trees. If a tree be thoroughly covered with the scale, burning is also the best treatment, as it will be almost impossible to clear such a tree sufficiently to make it valuable for its product, while it would be a constant menace to all other trees around. The sooner a badly infested tree is destroyed the better.

Kerosene.

During the winter months, while the trees are not growing, much stronger materials can be used for treatment than during the growing season. This is particularly the case between the first of January and the time when the buds begin to swell. During this period pure kerosene may be used under certain conditions with success. Kerosene will kill every scale which it touches, but, unless used in experienced hands, it is likely to kill the tree also, even during the late winter months, hence should be used with caution, and, as there are other and safer treatments, its use in general should be avoided. If it is desired to try it, however, the following suggestions should be closely followed:—

1. Use pure kerosene in January, February or March only.
2. Use the finest nozzle to the spray pump which can be obtained.
3. Stop spraying any portion as soon as it is wet.
4. Spray on a bright day, when a slight (not strong) breeze is blowing.

Crude Petroleum.

This substance has been recommended as an insecticide for scale insects by Dr. J. B. Smith of New Jersey, where it was first tried in 1898. While perhaps not beyond the experimental stage, as yet, it seems to promise well if precautions be followed in its use. Some of the conclusions drawn from experiments with it are: —

1. Treatment should be made in January, February or March.
2. Crude petroleum is not adapted to summer use.
3. It kills the scales wherever it comes in contact with them.
4. It may be used pure, but a more even distribution is obtained by mixing forty parts with sixty of water by means of a two-tank pump, such as the "Kerowater." Do not apply too much.
5. Use a very fine nozzle.
6. Spray on a reasonably calm day, when the trees are dry.
7. Use petroleum testing 43° Beaumé or above at 60° F. Petroleum testing lower than 43° at this temperature is dangerous to the trees.

In this last statement lies one of the chief difficulties. Crude petroleum is a very variable substance, and, if it be of too low a degree of the Beaumé scale, it is likely to injure the trees.

Fumigation.

While fumigation is the most certain method of destroying the scale, its use is not usually practicable by fruit growers in this State. Gas-tight tents, large enough to completely cover the trees, are necessary, and are expensive. The gas generated is a very dangerous one, and its use can hardly be recommended to one not familiar with it. It should be used for the treatment of nursery stock before shipment, however, and so many nurseries in this country now have the scale that it is desirable that only fumigated stock be purchased.

Whale-oil Soap.

This is usually a fish-oil rather than a whale-oil soap. It should be liquid when cold even in as strong a mixture as two pounds to a gallon of water. If it contains fats other than the fish oil, it is likely to prove unsatisfactory, and it should therefore be obtained from a reliable manufacturer. Two satisfactory

brands on the market are "Good's potash whale-oil soap No. 3," made by James Good of Philadelphia; and the "Anchor brand," made by Leggett & Bro., 301 Pearl Street, New York.

This soap should be dissolved in water at the rate of two pounds of soap to a gallon of water, by heat, and sprayed between the first of January and the time the buds open. If it is desirable to spray in the fall, this may be done after the leaves have fallen, using one pound to a gallon of water.

Treatment with whale-oil soap is probably the most practical for fruit growers to make use of in most cases.

Summary of Treatment.

1. Fumigation is the most effectual treatment known, but must be given under such conditions as to make it usually impracticable for general use by inexperienced persons.

2. Kerosene will kill the scale, and is likely to kill the trees as well. A strength of kerosene and water mixture which will not injure one kind of tree may kill another kind.

3. Crude petroleum may prove the best remedy to use, but must test above 43° Beaumé, and be used only in January, February or March.

4. The treatment recommended for general use, except in nurseries, is as follows:—

(a) Spray infested trees with whale-oil soap, two pounds to a gallon of water, before the buds start in the spring, or at the rate of one pound to a gallon of water, after the leaves are off in the fall.

(b) Cut back and prune infested trees before spraying, burning the prunings.

(c) Cover as much of the trunk and limbs with whitewash, about the first of June, as the tree will safely stand.

(d) Badly infested trees can probably never be entirely cleared, and, if left, will distribute the scale to all trees near by. Cut and burn all badly infested trees.

(e) In spraying for the scale, remember that, to be destroyed, each scale must be touched. Use a very fine nozzle, and try to reach every part of the tree, but stop spraying any part before it begins to drip.

5. Never purchase stock not accompanied by a certificate of inspection, signed by an authorized inspector, or by a guarantee that it has been fumigated with hydrocyanic acid gas. One who neglects this has only himself to blame if his trees prove later to have been infested.

MASSACHUSETTS

CROP REPORT

FOR THE

MONTH OF JUNE, 1901.

ISSUED BY

J. W. STOCKWELL,
SECRETARY STATE BOARD OF AGRICULTURE.

BOSTON:

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1901.

CROP REPORT FOR THE MONTH OF JUNE, 1901.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., July 1, 1901.

Bulletin No. 2, Crop Report for the month of June, is presented herewith. We desire to call the attention of our readers to the article at the close of the bulletin, on "A Lesson in Economics: what the Agriculture of the Twentieth Century demands," by Dr. George M. Twitchell, editor of the "Maine Farmer." Dr. Twitchell has given this subject much careful thought, and the result cannot but be helpful to every one, in pointing out places where savings can be made which may make all the difference between profit and loss.

PROGRESS OF THE SEASON.

Preliminary reports to the United States Department of Agriculture (Crop Reporter for June, 1901) indicate a reduction of about 1,200,000 acres, or 6.4 per cent, in the acreage of spring wheat. The average condition of spring wheat on June 1 was 92, as compared with 87.3 last year, 91.4 in June, 1899, and 92.6, the mean of the averages of the last ten years. The average condition of winter wheat declined during May 6.3 points, the condition on June 1 being 87.8, as against 94.1 a month earlier, 82.7 last year, 67.3 in 1899, and 81.2, the mean of the June averages of the last ten years.

The total reported acreage of oats was smaller than the acreage harvested last year by 3.8 per cent. The average condition of oats was 85.3, against 91.7 last year, 88.7 in 1899, and a ten-year average of 90.

The acreage reported as under barley is 1.2 per cent smaller than the area harvested last year. The average condition of barley was 91, against 86.2 last year, 91.4 in 1899, and a ten-year average of 88.5.

The acreage under rye showed a reduction of 1.9 per cent from that harvested last year. The average condition of rye was 93.9, as compared with 87.6 on June 1, 1900, 84.5 at the corresponding date in 1899, and a ten-year average of 89.4.

The acreage and condition of clover could not be definitely and satisfactorily determined, but would seem to approximate, on the whole, very closely to the averages of the last ten years.

The average condition of the apple crop was, on the whole, favorable, though in some of the larger producing States the condition is somewhat below their ten-year average. Of the fourteen States having 3,000,000 or upward apple trees at the last census, three report conditions below their ten-year averages, one was the same, and the others were above. It is probable that more than an average crop will be produced in the remaining States and Territories.

The prospects of the peach crop were highly favorable, the condition being above the average in every important peach-growing State, with the exception of California, in which there was a falling off of 13 points from the ten-year average of 83.

The acreage of rice has been somewhat reduced, except in Louisiana, in which there was an increase of 12 per cent, and in Texas a very large increase of approximately 125 per cent. The condition was generally equal or above the ten-year average.

The total estimated area planted in cotton is 27,532,000 acres, an increase of 2,111,000, or 8.3 per cent, over the acreage planted last year, and of 2,498,000, or 10 per cent, over the acreage actually picked. The average condition of the growing crop June 1 was 81.5, as against 82.5 last year, 85.7 in 1899, and 86.4, the mean of the June averages of the last ten years. The condition was the lowest, with one exception, of any June condition in twenty years.

In Massachusetts the acreage of rye as compared with last year was given as 98, and the average condition June 1 as 101; the acreage of oats as 94, and the condition as 95; the acreage of barley as 90, and the condition as 86; the acreage of clover as 99, and the condition as 103; the average

condition of spring pasture as 105; the average condition of apples as 67; and the average condition of peaches as 75.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending June 3. — The week was decidedly cool to the eastward of the Mississippi River, and also in the west Gulf States, Oklahoma and New Mexico. It was slightly cooler than usual along the immediate Pacific coast and over the central and southern Plateau regions. The week averaged warmer than usual in Minnesota, the Dakotas, western Nebraska, Montana and Wyoming, and over portions of Washington, Oregon and northern California. Very heavy rains fell during the week in the east Gulf States, over portions of northern Texas, Oklahoma and northern New Mexico, the north-eastern Rocky Mountain slope, portions of the lower Lake region, and generally throughout New England and the northern portion of the middle Atlantic States. There was less than the average weekly rainfall over the southern portions of the middle Atlantic States, the lower Ohio, central and upper Mississippi and Missouri valleys, and on the west Gulf coast, a large area in the lower Missouri, upper Mississippi and Red River of the North valleys receiving no measurable rainfall.

Week ending June 10. — The week was cooler than usual from the north Pacific coast eastward to the Lake region, including the northern portions of the central valleys and middle Atlantic States. The week was slightly cooler than usual in California and in portions of the east Gulf and south Atlantic States. Along the immediate New England coast, in portions of southern Florida and from the lower Mississippi westward to Colorado and New Mexico the week averaged warmer than usual. Heavy rains fell over portions of the middle and south Atlantic States and in the Ohio, central Mississippi and Missouri and Red River of the North valleys, and more than the average amount fell in Oklahoma, southern Kansas and portions of New England. A considerable portion of the south Atlantic and Gulf States received less than the usual amount, and the weekly rainfall was largely

deficient in the Lake region, and also in portions of the middle Atlantic States, upper Ohio and lower Missouri valleys, a considerable area in the Lake region receiving no measurable amount.

Week ending June 17. — The week was warmer than usual in the west Gulf States, lower Missouri valley, throughout the Mississippi valley and in all districts to the eastward, except along the middle and south Atlantic and east Gulf coasts. The week was marked by unseasonably low minimum temperatures over the eastern Rocky Mountain slope and in northern New England, and unusually high maximum temperatures in the lower Mississippi valley and on the west Gulf coast. The week was marked by exceptionally heavy rains in the middle and south Atlantic States and over an area extending from northern Colorado and southern Wyoming north-eastward over western Nebraska, the Dakotas, to Minnesota and northern Wisconsin. There was a general absence of rain throughout the central and west Gulf districts, and over a large part of New England and the lower Lake region. The precipitation was generally below the average over the greater portion of the central valleys and the northern portion of the middle Atlantic States.

Week ending June 24. — The week was slightly cooler than usual along the Atlantic coast, over portions of the upper Lake region, eastern Montana and in California. Throughout the central valleys, southern States, Rocky Mountain region and on the north Pacific coast the week was warmer than usual, particularly in the lower Missouri, central Mississippi and lower Ohio valleys. Generally throughout the southern States, on the middle Atlantic coast, over a large part of the upper Lake region, and in portions of the upper Mississippi, lower Missouri and Ohio valleys the rainfall was below the average, there being practically none over the greater part of the central and west Gulf States. In northern New England, northern and western New York, eastern North Carolina, the Florida peninsula, portions of the central and upper Ohio valley the rainfall was excessive. Good rains also fell over south-eastern Kansas and Oklahoma, and the northern portion of the upper Lake region.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending June 3.—New England. Boston: Farm work and crops at a standstill; sunshine and warm, drying weather needed; grass excellent; small fruits promise well; little corn planted, land too wet and cold; potatoes good in Aroostook County, Me., elsewhere poor, seed rotting in ground.

Week ending June 10.—New England. Boston: Week favorable; much planting done; low land remains too wet to work; grass continues excellent, heavy hay crop assured; all small fruits promise well; corn poor; potatoes fair; sunshine and warmer weather needed.

Week ending June 17.—New England. Boston: Weather favorable; planting completed; all crops much improved and now growing rapidly; heavy hay crop promised and haying will begin soon; abundant crop of small fruits and berries promised; potato bugs numerous.

Week ending June 24.—New England. Boston: Weather favorable; all crops making good growth; some damage by frost on the 18th to potatoes in Aroostook County, Me.; haying commenced, will be general the coming week; potato bugs very numerous, otherwise insects and bugs few.

THE WEATHER OF JUNE, 1901.

The month opened with a week of generally cloudy, cool weather. Rain was of frequent occurrence although the amounts were generally light to moderate. The temperature during this period was quite uniform, with a mean near the average. From the 10th to the 20th, inclusive, the weather was partly cloudy to clear, with almost an entire absence of rain. The temperature ranged somewhat above the normal till the 11th, followed by several days of cool weather, with the mercury from four to six degrees below the normal. There was a season of showers from the 21st to the 25th. The rainfall was, however, unevenly distributed, being excessive in some instances while in others the amounts were unimportant. The showery conditions were accompanied with easterly winds and fogs in coast

sections. During the remainder of the month the weather was generally fair, with the temperature above the normal. The last four days of June were excessively warm, with the maxima temperatures at Boston ranging from 92° to 97° and the minima from 71° to 74°. Viewing the month as a whole the precipitation was largely deficient, the average being little more than half the normal for the month of June. The average temperature was several degrees above the normal. At Boston the accumulated excess for June was 54°. There was less than the usual number of thunderstorms, and, with few exceptions, they were less violent than those generally experienced during this month. The winds were southerly to westerly, and the absence of easterly winds was a noticeable feature of the weather of the month. About 30 per cent. of the wind direction was from the southwest. Considered as a whole, for the entire State, June was a very pleasant month.

In the circular to correspondents, returnable June 22, the following questions were asked: —

1. What insects are proving injurious in your locality?
2. How is Indian corn looking, and what is the acreage as compared with previous years?
3. Has haying begun, and what is the prospect for the crop?
4. How does the acreage of early potatoes compare with previous years, and what is the promise for the crop?
5. How do early market-garden crops compare in yield and price with previous years, and what is the promise for the crop?
6. How do the quantity and price of dairy products and the supply and price of dairy cows compare with former years?
7. What is the condition of pasturage in your locality?
8. What is the outlook for such fruits and berries as are grown for market, naming them?

Returns have been received from 134 correspondents, and from them the following summary has been made up: —

INSECTS.

Not for many years has there been as little complaint of damage from insects as at present. Potato bugs are present in the usual numbers, but are not doing particular damage as yet. Other insects most complained of are cut worms, tent caterpillars, canker worms and squash bugs, from 12 to 20 correspondents reporting the presence of each. Other insects mentioned are rose bugs, currant worms, wire worms, plant lice, onion maggots, elm leaf beetles, cattle flies of various kinds, asparagus beetles, cabbage worms, brown-tail moths, and cranberry vine and fire worms.

INDIAN CORN.

The cold, wet spring delayed corn planting so that it is now very small and backward for the season. A good stand is generally reported, however, and it is also said to be coming forward rapidly with the advent of hot weather, and to generally promise well. The acreage appears to be about an average one, reports of decreased acreages in some localities being practically balanced by reports of increases in others.

THE HAY CROP.

Haying was beginning in many localities at the time of making returns, and by date of issue should be well under way almost everywhere. A good crop seems to be generally expected, certainly much better than for the last two years. There are some complaints that the grass roots were injured to such an extent last year that the crop will be thin on old fields, and this expectation seems reasonable. Therefore reports after harvest will be needed to settle the standing of the crop as a whole.

EARLY POTATOES.

The acreage of early potatoes shows a slight decrease, especially in eastern sections, probably owing to the unfavorable weather at planting time. There was also some complaint of their rotting in the ground. Being generally planted late they are backward for the season, but otherwise looking well.

MARKET-GARDEN CROPS.

Early market-garden crops are about average as to yield and price, though somewhat backward. Asparagus was rather a light crop but brought good prices. Later crops look well and promise good yields if conditions continue favorable.

DAIRY PRODUCTS.

The quantity and price of dairy products appears to be about as last year, the gain in price noted at that time having been fully held. The supply of dairy cows continues to be less than the demand, and their prices certainly are as high as in past years.

PASTURAGE.

Pasturage was much benefited by the rains of April and May and is generally in first-class condition. There are a few complaints that the grass is weak and sappy, but they are by no means numerous.

FRUITS AND BERRIES.

Strawberries were late in ripening, but at time of making returns picking had begun, with the prospect of an average crop, though hardly a large one. Prices, so far as reported, were good. Raspberries and blackberries, particularly the latter, winterkilled to a considerable extent, and the crop of both will be short. Currants generally promise well. Apples will be a light crop, particularly winter varieties. Peaches promise only a light crop. Plums and cherries generally set full and promise a good crop. Pears set well and promise an average crop. Wild berries promise well.

NOTES OF CORRESPONDENTS.

[Returned to us June 22.]

BERKSHIRE COUNTY.

Alford (L. T. OSBORN).—Indian corn is very backward but is coming on rapidly just now; acreage about as usual. Haying has not begun; the crop will be fair but not as good as was expected, as the grass roots were killed by the dry weather of last year. The acreage of early potatoes is about the same as usual and they are looking well. Quantity and price of dairy products and supply and price of dairy cows about normal. Pasturage is in very fair condition. Strawberries are a fine crop, but few other fruits and berries grown.

Tyringham (E. H. SLATER).—Corn is backward, but the acreage is about the same as in previous years. Haying has not begun and the crop will be light. The acreage of early potatoes is about the same as last year and the crop is very backward. The price of dairy products is about the same as in former years. Pasturage has been very good. The outlook for apples is very good; not much done in small fruits and berries.

Becket (W.M. H. SNOW).—Potato bugs are doing some damage. Indian corn is looking well but is small. Haying has not yet begun. The acreage and condition of early potatoes is about average. Market-garden crops are not much raised. The quantity of dairy products is good and the prices fully average. Pastures are in good condition. Strawberries, raspberries, blackberries and huckleberries promise well.

Richmond (T. B. SALMON).—Potato bugs, rose bugs, currant worms and small black flies are doing some damage. Indian corn is very small, having all been planted late, but looks well; acreage, 75 per cent. of the average. Haying has not begun, but the prospect for the crop is good. The acreage of early potatoes is about the same as usual. Early market-garden crops are average in yield and price, and the prospect is good for later ones. There is more butter made than in previous years, with prices about the same; supply and price of dairy cows about normal. Pastures

are in good condition. Strawberries and raspberries good, blackberries winterkilled, cherries good, apples good in some orchards and very scarce in others.

Cheshire (L. J. NORTHUP).— Potato bugs are the most plentiful insect. Corn stands very well but is backward ; acreage about as in previous years. Haying has not begun, but the prospect for the crop is fair. The acreage of early potatoes compares favorably with former years, but the crop is not far enough advanced to report on. Market-garden crops are not up to former years, owing to the wet season. The quantity of dairy products is well sustained, also prices of dairy cows. Pastures are holding their own remarkably. Blackberries promise a large yield.

New Ashford (ELIHU INGRAHAM).— Indian corn is small and backward ; acreage average with former years. Haying has not begun, but the crop will be about an average one. The acreage of early potatoes is about average, and the crop promises fairly well. Early market-garden crops are backward, and the promise for those not yet harvested is fair. The quantity and price of dairy products compares well with former years, but the supply of cows is small. Pasturage is in good condition.

Florida (E. D. RICE).— Potato bugs are quite plenty. Corn is quite backward, some fields being just out of the ground ; acreage about as usual. Haying will not commence until about July 1, but a good crop is promised. Acreage of early potatoes about as usual, but crop very late. Butter is in good demand, and cream also brings a good price. Pastures are in very good condition. Apples will not be a full crop ; strawberries and blueberries are abundant ; currants will be a large crop ; no peaches ; other fruits looking well.

FRANKLIN COUNTY.

Charlemont (S. W. HAWKES).— Potato bugs, wire worms and cut worms are doing damage to a small extent. Corn is looking well but is some two weeks late. A few have commenced haying ; new fields good, old fields rather light. Potatoes are late and the acreage is about average. Very little is done in market-garden crops here. The quantity and price of dairy products and the supply and price of dairy cows is about as usual. Pasturage is in very good condition.

Conway (J. C. NEWHALL).— Plant lice are troubling plum and cherry trees and currant bushes. Corn is rather late on account of cold and wet, but has improved very much the past week. Very many have begun haying and the prospect is for a heavy crop. Acreage of early potatoes about as usual, and the crop is rather

late. The quantity and price of dairy products are up to the usual average, and dairy cows are in good demand at good prices. Pastures are in good condition. The outlook for fruits and berries is hardly up to the average, and the apple crop appears to be very short.

Bernardston (R. H. CUSHIMAN). — Corn is small but growing fast; acreage fully up to the average. Haying is well under way with the prospect of a good average crop. Potatoes look well with the usual acreage. The price of cream is very unsatisfactory, but there is a strong demand for dairy cows at good prices. Pastures are in first class condition. Apples will not be up to an average crop. Cut worms are seriously injuring some fields of corn. An unknown worm of the inch worm habit is increasing its devastated territory, leaving a ruin of defoliated trees. It has a preference for the chestnut but thrives on the willow.

Gill (F. F. STOUGHTON). — Insects are not making very much trouble. Indian corn is very late, and more has been planted than a few years ago. Haying is beginning in a small way, with the prospect of a good crop. Dairy cows are higher than they were a few years ago, and good new milch cows are bought up pretty close for the Boston market. Pasturage is in extra good condition.

Northfield (R. T. CALLENDAR). — Plant lice are affecting many shade trees. Corn is small for the season, but is looking well; acreage about average. Haying has not begun; grass late but promises better than an average crop. Potatoes are late but are looking well; acreage larger than usual. All dairy products are in good demand at about average prices; dairy cows high. Pasturage was never in better condition. Berries are little grown, but are looking well. Tobacco was set very late, but a good stand was secured. Cucumbers for pickling are looking well.

Wendell (N. D. PLUMB). — Potato bugs, wire worms and cut worms are doing damage to a small extent. The outlook for the hay crop is the best for years. The acreage and condition of early potatoes are about normal. But little has been done with market-garden crops owing to the wet season. Dairy products are in good demand at good prices and dairy cows are in good demand at high prices. Pasturage is in the best condition for years. Berries, with the exception of blueberries, are very nearly a failure. Crops of all kinds are from two to three weeks later than usual, and some are now planting corn and potatoes.

Leverett (W. L. BOUTWELL). — Cut worms are doing some damage. Acreage of Indian corn is about average, but the crop is very backward and not very well stocked. Haying has begun, with the prospect of an average crop. The acreage of early potatoes is

about average, but they are very backward. Market-garden crops are normal in yield and price. Dairy products are about the same as last year in yield and price, but dairy cows are high. Pastures are in poor condition. This is a good year for all small fruits.

Orange (ANSEL HARRINGTON).— Potato bugs and squash bugs are doing some damage. Indian corn is backward, and the acreage is less than in former years on account of the wet weather, which prevented planting. Haying has just begun, with good prospect of a heavy crop. The acreage of early potatoes is about the same as in former years, with the prospect of a fine crop. The yield and price of market-garden crops is about the same as in former years. The quantity and price of dairy products and the supply and price of dairy cows are better than formerly. Pastures are in excellent condition. The apple crop will be light; plums and all kinds of small fruits promise well. Frost on the 17th did some damage to beans and vines.

HAMPSHIRE COUNTY.

Prescott (W. F. WENDERMUTH).— Potato bugs are doing some damage. Corn is small and nearly two weeks late; acreage about average. Haying will not begin for a week or more, but the crop will be nearly an average one. Acreage of early potatoes about average; crop a little late but looking well. Quantity of dairy products as usual, price fully up to the average; cows bring a little higher prices than usual. Pasturage is fairly good but needs rain. Apples are a very short crop even for an off year; huckleberries and blueberries promise a fair crop.

Amherst (WM. P. BROOKS).— Squash bugs, potato bugs and onion maggots are doing some damage. Indian corn is late but is now starting well; acreage about as usual. Haying has begun and the crop will be above the usual average. The acreage of early potatoes is about as usual and the crop looks well. Peas are exceptionally good, asparagus light, other market garden crops promise well. There are no marked changes in the quantity and price of dairy products and the supply and price of dairy cows. Pastures are in good condition. Strawberries light, raspberries and blackberries badly winterkilled, apples a small crop, peaches promise well, currants and gooseberries good, pears promise well but are little grown.

Easthampton (WM. C. CLAPP).— Potato bugs, plant lice and squash bugs are doing some damage. Corn is looking well though many fields were planted late, owing to the ground being too wet to work. Haying has begun, with a fair average crop; early seeded

pieces heavy, late seeded light. The acreage of early potatoes is less than usual and the promise now is for a light crop. Yield of market-garden crops less than usual, prices good; asparagus short yield with high prices; beans and beets are looking well. The quantity and price of dairy products are fully up to the average, and dairy cows are in good demand. Pasturage is in very good condition. Fall apples fair, winter apples short; strawberries a fair crop; blackberries bloomed full; red raspberries winterkilled.

Westhampton (H. A. PARSONS).—Indian corn is late but is looking well. Haying has begun and there will be a full crop. There is the usual acreage of early potatoes and they are looking well. Market-garden crops are late but bring good prices. Supply and price of dairy products and dairy cows are good. Pasturage is in good condition. Strawberries are a good crop and other berries are coming on and looking well.

Williamsburg (F. C. RICHARDS).—Potato bugs are doing some damage but are not bad as yet. The acreage of Indian corn is slightly increased, and it is looking well though somewhat backward. Haying has begun with about a three-fourths crop, less than was expected. Acreage of early potatoes about the same as usual, with the prospects for the crop good. Quantity and price of dairy cows and supply and price of dairy products about the same as usual. Pastures are in good condition. Winter apples light; fall apples a good crop; berries good; cherries blasting and rotting on the trees; plums good; no peaches.

Middlefield (J. T. BRYAN).—Not much damage from insects. There is the usual acreage of corn and though it was planted very late it is coming on finely. Haying has not begun but the crop promises to be a fair one. Potatoes are looking well with about the usual acreage. Not much is done at market-gardening here. Price and quantity of dairy products about average; dairy cows rather low. Pasturage is in excellent condition. All fruits promise good crops.

HAMPDEN COUNTY.

Blandford (E. W. BOISE).—Potato bugs are doing some damage. Indian corn is very small with about the usual acreage. Haying has not begun and the prospect is poor, crop very light except on rich lands where average yields may be looked for. Early potatoes have an average acreage but it is too early to report as to the prospect. Price of dairy products fully up to the average; no call for cows, prices when sold 10 per cent less than for several years. Pastures are in good condition. Wild berries promise a full crop. The season's work is fully two weeks behind.

Southwick (L. A. FOWLER). — Potato bugs and cut worms are doing some damage. Indian corn is looking well; no noticeable increase in the acreage. Very little haying has been done but there is the prospect of a large crop. Acreage of early potatoes about the same as in previous years and the vines are looking well. Market-garden crops are about as usual in yield and price and those not harvested promise well. Quantity and price of dairy products about the same as last year; good cows bring a high price. Pasturage is in good condition. There is an abundant crop of strawberries now being harvested; raspberries, blackberries, cherries, peaches and pears promise large crops; apples probably half a crop.

Chicopee (R. W. BEMIS). — Elm-leaf beetles are doing some damage to the elms. Corn is looking well where planted in season. Many farmers have commenced haying with the prospect of a large yield. There was quite a good acreage of potatoes planted, and those planted early are in blossom and look finely. Early planted market-garden crops look finely; those planted later do not look so well. There is a scarcity of milch cows in this vicinity. Pasturage is in good condition, but the grass is rather more sappy than usual. Small fruits and berries blossomed well and should fruit well.

Longmeadow (W. F. EMERSON). — Rose bugs, elm beetles and cut worms are doing some damage. The acreage of Indian corn is increased probably one-fifth, and although backward it is coming on finely. Haying has commenced on uplands, and a good crop is promised on new seeded fields. The acreage of early potatoes is average and the promise good. No special change in the yield and price of market-garden crops. No particular change in the quantity and price of dairy products and the supply and price of dairy cows. Pastures are in fair condition. Strawberries have been a good crop; plums, peaches, pears and apples promise well; also blackberries and raspberries.

East Longmeadow (J. L. DAVIS). — Insects are not very troublesome, except potato bugs. The acreage of Indian corn is increased one-third, and it is looking well though late. Haying is just beginning, and the crop is not over 80 per cent. of an average. Very few early potatoes were planted; potatoes are coming up very unevenly, some not at all. Not much is done with market-garden crops in this town. Milk is about average in quantity and price; dairy cows about as last year. Pasturage is in very good condition. Strawberries excellent; raspberries good; pears, peaches and plums plenty; late apples set poorly, early ones plenty.

Wales (C. F. CRAWFORD). — Tent caterpillars and potato bugs are doing some damage. Corn is looking well with about the usual acreage. No hay is cut as yet, but the crop will be good. Potatoes are looking thrifty, but are late; acreage about as usual. Dairy products are plenty with prices about as common; dairy cows are a little lower than formerly. Pastures are in better condition than usual. Peaches, pears, grapes and berries are very plenty; apples will make a full crop.

WORCESTER COUNTY.

Dudley (J. J. GILLES). — Potato bugs and squash bugs are doing some damage. Indian corn is very backward, and excepting that grown for fodder the acreage is small compared with previous years. Haying is just beginning, with the prospect good for an extra abundant crop; long seeded fields about average. Acreage of early potatoes small and very uneven, so it is hard to predict results. Early peas are in fine condition, other market-garden crops very backward. The quantity and price of dairy products and the supply and price of dairy cows are about normal. Pasturage is in fine condition. Strawberries are somewhat below the average, blackberries the same, and raspberries decidedly below.

Warren (W. E. PATRICK). — Indian corn is very backward with about the usual acreage. A few farmers have begun haying; crop about average. The acreage of early potatoes is about the same as usual, but the crop is backward though otherwise looking well. Early market-garden crops are nearly two weeks late; prospect good for later ones. Dairy products do not vary much in quantity or price; shortage in good dairy cows with price for same high. Pasturage is in excellent condition.

North Brookfield (J. H. LANE). — Potato bugs and squash bugs are plenty. Corn is late but is growing very fast, and the late planted is vigorous. Haying has barely begun with the prospect of a good crop, although some fields show the effects of the winter. The acreage of early potatoes is about the same as usual, but they are very late. The yield of market-garden crops may be all right but they are too late to be called early. The present conditions should increase the supply of milk. Pasturage is in fine condition. The prospect for fruits and berries is good except for apples, which will be a light crop.

Gardner (A. F. JOHNSON). — Indian corn looks well, but is rather late; acreage average. Haying has not begun but there will be a good average crop. There is no change in the acreage of early potatoes, and they are looking well. Market-garden crops

are about as usual in yield, price and condition. Quantity and price of dairy products and supply and price of dairy cows has not changed materially. Pastures are in fairly good condition. Wild berries, blueberries and raspberries are very scarce; blackberries blossoming well.

Ashburnham (E. D. GIBSON). — Potato bugs are doing some damage and apple tree borers are very numerous; tent caterpillars are fewer than for 25 years. Indian corn is very backward, but there is a good stand; acreage for the silo the same as usual, but there will be less for husking owing to the wet spring. Haying will not begin for two weeks; the crop will hardly be an average one; old fields very light. Early potatoes are average in acreage but are very backward, many fields just coming up. The quantity and price of dairy products is as good as in any recent year; good milch cows bring from \$40 to \$55, and there are only enough to supply the demand. Pastures are in good condition but need rain. Pears promise a great crop; early apples a good crop, Baldwins a failure.

Westminster (G. A. STOCKWELL). — Tent caterpillars are doing some damage. Potatoes and corn are hardly out of the ground, and market-garden crops are not far enough advanced as yet to report upon. Haying has not begun but there will be a good crop. The quantity and price of dairy products is about as usual, also the supply and price of dairy cows. Pasturage is in good condition. There will be a large supply of all kinds of berries and small fruits.

Princeton (A. O. TYLER). — Cut worms, potato bugs and currant worms are doing some damage. Indian corn is looking fair but is backward. Haying is just beginning, with a fair crop. Early potatoes and market-garden crops are not raised here. Quantity and price of dairy products and supply and price of dairy cows are about as usual. Pasturage is in extra good condition. Pears, plums and cherries are very good crops, as are berries of all kinds also.

Holden (G. S. GRAHAM). — Potato bugs are very numerous. Indian corn is very small and backward, with about the usual acreage. Little haying has been done as yet, but the prospect for the crop is good. The acreage of early potatoes is about as usual, but it is too early to judge as to condition. Quantity and price of dairy products are a little higher than usual, and dairy cows are fully as high as in former years. Pastures are in good condition. Strawberries are quite abundant.

Southborough (E. F. COLLINS). — Potato bugs are doing some damage; other insects are not as numerous as in some years. En-

silage corn is looking well but is late. Not much hay has been cut as yet, but there will be a full crop. The acreage of early potatoes is one-half the usual average, but they are looking well. Wet weather delayed the starting of market-garden crops, but they are doing well now. Dairy products bring about the same price as usual, but dairy cows are higher. Pastures are in fair condition. There will be very few apples, and peaches are not over half a crop.

Hopedale (DELANO PATRICK).—No insects are doing much damage. Indian corn is very backward; there is the same acreage for forage and the silo as usual. Haying has not begun, but the prospect never was better. The acreage of early potatoes is about two-thirds of the usual average; crop looks well, but is backward for the early market. Early market-garden crops are about the same as usual in yield and price. The quantity and price of dairy products are quite as good as usual. Pastures are in excellent condition. The apple crop will be light.

Sutton (C. P. KING).—Corn looks poorly and the acreage is small compared with previous years. Haying has not commenced but there is prospect of a heavy crop. The acreage of early potatoes is small and promises only a small crop. There are scarcely any early market-garden crops planted this year and prices are high. Dairy products are abundant and prices low; dairy cows plenty and prices low. Pasturage is in fine condition. Strawberries are ripening well and command a ready market; cherries blasting in some places; pears and plums look well; apples about a three-fourths crop.

Douglas (J. M. RAWSON).—There are fewer tent caterpillars than for years. Corn is in fair condition with an increased acreage; crows are pulling it badly. Haying has not begun but the crop will be a little heavier than last year. The acreage of early potatoes is less than usual owing to the wet weather, but some are planting now. All market-garden crops are backward. Quantity and price of dairy products about as usual and cows sell at a little better prices. Pasturage is in the best condition for years. Strawberries are a light crop, blackberries fair, currants fine.

MIDDLESEX COUNTY.

Framingham (J. S. WILLIAMS).—Squash bugs and potato bugs are doing some damage, and cut worms are working badly on all garden crops. Corn is generally backward, though there are some good fields. Some have begun haying, and the crop will be larger than last year; quality in doubt. Potatoes are looking well, with

the usual acreage. Asparagus has sold well, quality not as good as usual; rhubarb sold low; peas doing well. Quantity and price of dairy products compares favorably with other years. Pastures are looking uncommonly well, but the grass is weak and sappy. No apples to mention; fair prospect for pears; strawberries looking well and selling well.

Stow (G. W. BRADLEY). — Potato bugs are doing considerable damage. Corn is very backward for the season; acreage about the same as usual. But little haying done as yet; a good crop in view. A great many early planted potatoes rotted in the ground; too early to estimate on late ones. Quantity and price of dairy products and supply and price of dairy cows about the same as usual. Pastures are looking well. Strawberries set heavily but are drying up; blackberries and raspberries winterkilled badly.

Westford (J. W. FLETCHER). — Indian corn is rather small but is looking well, with acreage increased over last year. Some have begun haying, but hay is growing very fast and will be a good crop. The acreage of early potatoes is above the average, and the prospects now are for a good crop. Quantity and price of dairy products and supply and price of dairy cows about the same as usual. Pasturage is in good condition. Strawberries and raspberries are doing well, but blackberries are a failure.

Pepperell (P. J. KEMP). — Potato bugs are doing some damage. Corn is very backward and not as much as usual was planted on account of the late, wet spring. No haying has been done as yet, but the crop will be a fourth larger than last year. The acreage of early potatoes is about the same as usual, but they are very backward. Quantity and price of dairy products and supply and price of dairy cows about as usual. Pastures are in good condition.

Carlisle (E. J. CARR). — Canker worms are doing some damage. Indian corn is looking well but is very backward as yet; acreage about the same as last year. Haying has not begun to any extent but the prospect is good for a heavy crop. Not as many early potatoes were planted as usual, but they are looking well. Asparagus is about our only market-garden crop and is a fair crop with good prices. Quantity of milk full and prices about the same as last year; good cows are scarce and high. Pasturage is in the best condition. Strawberries a fair crop, blackberries winterkilled badly, plums have set for a full crop, but few apples.

Concord (W. H. HUNT). — Asparagus beetles have been abundant. Acreage of Indian corn about the same as usual, but it is late owing to cold weather. Some early fields of hay have been cut and the prospect for the crop is good. Acreage of early potatoes about the same as usual, but there is some complaint of

the seed rotting in the ground. Early market-garden crops have sold well, asparagus especially so. The quantity and price of dairy products and the supply and price of dairy cows are about the same as usual. Pasturage is in very good condition. Strawberries are a fair crop, apples light, no peaches, pears fair.

Lincoln (C. S. WHEELER). — Potato bugs are doing some damage. Very little Indian corn is planted in this town, sweet corn almost entirely. Haying has begun with an average crop. The acreage of early potatoes is about as usual, with the promise of a good crop. Asparagus is a short crop, with prices good. Quantity and price of dairy products, and supply and price of dairy cows, about as last year. Pasturage is better than common, but pastures are generally neglected. Strawberries a good crop, currants fair, apples poor.

Woburn (W. H. BARTLETT). — Canker worms, tent caterpillars and cut worms are doing some damage. Very little Indian corn is raised in this vicinity. Sweet corn for market is backward, with about the usual acreage. Haying has begun and the crop is heavier than usual and looking finely. The acreage of early potatoes is about the same as usual; they are now coming into bloom, and it is too early to estimate the crop. Early market-garden crops are about the same as usual so far, with prices very good; asparagus about a one-third crop and prices extra. Not much change in either the supply or price of dairy products; stock looking well. Pastures are in very good condition indeed. Cherries blighted, not half a crop; no peaches; few pears; raspberries and blackberries winterkilled; apple crop will be light, Baldwins especially; currants looking well and commencing to color.

Wakefield (CHAS. TALBOT). — Canker worms and brown-tail moths are doing damage, many pear trees being entirely stripped by the latter. Acreage of Indian corn about as usual, but backward owing to cold, wet season. Hay is a large crop, and some have commenced cutting. The acreage of early potatoes is about 80 per cent. of last year, and a fair crop is promised. Early market-garden crops are about the same as last year in yield and price. Quantity and price of dairy products about as last year; dairy cows a shade lower in price. Pasturage is in very good condition. Strawberries, raspberries and blackberries are very good; fruit large and of good flavor.

Stoneham (J. E. WILEY). — Canker worms and brown-tail moths are doing some damage. Indian corn is backward, with about an average acreage. Haying has begun and the prospect for the crop is good. The acreage of early potatoes is about the same as usual, with the promise for the crop good. Prices for market-garden

crops have been above the average, and there is a fair prospect for those not yet harvested. The quantity and price of dairy products and the supply and price of dairy cows have been a fair average. Pasturage is in fine condition. Strawberries, blackberries and apples will be good crops.

ESSEX COUNTY.

West Newbury (J. C. TARLETON).—Canker worms and tent caterpillars are doing some damage. Corn is backward but holds its acreage average with other years. Haying has not begun but the grass crop is very heavy. The acreage of early potatoes is below previous years, but there is the promise of a fair crop. Yield of early market-garden crops above average; those not harvested looking well. Dairy products are about as usual as to quantity and price and good dairy cows bring a high price. Pastures are in good condition. Pears, plums and peaches are few; small berries about the average of former years.

Groveland (ABEL STICKNEY).—Canker worms are doing some damage. The season is late and corn is small; acreage of field corn less, but that for forage greater. No hay has been cut but the prospect for the crop is very good. The acreage of early potatoes is less than usual. Very few market-garden crops harvested; looking fairly well but late. Price of dairy products about the same as usual, milk mostly for market, cows rather high. Pastures are in better condition than usual. Plums, peaches and pears fair; cherries and currants not plentiful; apples few.

Ipswich (O. C. SMITH).—Potato bugs and cut worms are doing some damage. Indian corn is now growing well and the acreage is about the same as usual. Most farmers have commenced haying and the crop will be double what it was last year. Acreage of early potatoes the same as usual and the crop is growing well. No market-garden crops marketed as yet, all look well except beans. Dairy products do not vary much in quantity and price, but dairy cows sell for higher prices than usual. Pastures are in good condition and stock have all they can eat. Wild berries will be plentiful.

Topsfield (B. P. PIKE).—The usual number of potato bugs and horn flies are with us. Indian corn is very backward, with about the usual acreage. Haying has not begun; crop good but not as heavy as some years. The acreage of early potatoes is reduced, and they are very late. Asparagus was a poor crop but brought good prices, no other market-garden crops marketed. Price of milk the same as last year; cows about the same. Pasturage is in

good condition. Strawberries promise a large crop; no peaches; plums and apples, which blossomed well, did not set well.

Wenham (N. P. PERKINS).—Squash bugs, carrot lice and potato bugs are doing some damage. Not much corn is planted, except for the silo and for fodder; not as large an acreage as last year. There is the prospect of a good crop of hay on well manured land, but it will be poor on old land. Acreage of early potatoes about average, but the crop will be below. There is a fair prospect for peas, lettuce, spinach, etc. Quantity and price of dairy products the same as usual; good cows bring high prices. Some high pastures are getting short, but as a rule they are in good condition. There is a fair prospect for strawberries, currants, etc.

Manchester (JOHN BAKER).—Squash bugs, canker worms, cut worms and currant worms are doing some damage. Corn is looking well, with acreage about the same as last year. Haying has just begun, with the prospect of a fine crop. The acreage of early potatoes is about the same as usual, and the crop promises well. Early market-garden crops are about average in yield, with prices higher, if anything; prospect good for those not harvested. Quantity and price of dairy products about the same as usual; dairy cows are high. Pasturage is in good condition. Apples, pears and peaches fair; plums good; strawberries good, just coming on well; blackberries and raspberries good.

NORFOLK COUNTY.

Cohasset (E. E. ELLMS).—Tent caterpillars are doing some damage. Indian corn looks well and compares well in acreage with previous years. Haying has begun, with the prospect of a great crop. The acreage of early potatoes is about the same as usual, with the promise of a fair crop. Early market-garden crops are about average in yield and price. Quantity and price of dairy products, and supply and price of dairy cows about normal. The condition of pasture is excellent. Strawberries and raspberries are very good crops.

Canton (E. V. KINSLEY).—Indian corn is somewhat backward, with the acreage about as usual. Haying has begun, with the prospect of a good but not excessive crop. Acreage of early potatoes about average, and they are looking finely at present. Milk is in full supply, prices up to average or a little better, 28 to 30 cents per can of $8\frac{1}{2}$ quarts net; cows in good supply with prices well up. Pastures are at their best. The outlook for apples, pears, cherries and plums, also peaches where grown, is excellent; also for strawberries, blueberries and blackberries.

Westwood (H. E. WEATHERBEE).—Currant worms are doing some damage, and potato bugs are thick. Indian corn is looking well but is backward; acreage not over half of the usual average. Haying has begun, and the prospect is for a good crop. Acreage of early potatoes about as usual, and the crop is looking well. Early market-garden crops are up to the average, and the prospect is good for those not yet harvested. The quantity and price of dairy products is up to the average, and dairy cows are scarce and higher than formerly. Pasturage is in good condition. Strawberries are a good crop, and currants are looking well.

Millis (E. F. RICHARDSON).—Potato beetles are doing some damage. Corn is very late, and the acreage is much less than usual. Hay is a large crop, with the exception of low lands and meadows. The acreage of early potatoes is smaller than usual, with the promise of a good crop. Early vegetables are high, less than the usual acreage having been put in. Cows are doing well. Pasturage is in A No. 1 condition. Small berries will be plenty, such as strawberries, blackberries and raspberries.

Franklin (C. M. ALLEN).—Potato bugs are more plentiful than usual. Indian corn is looking fairly well but is late; acreage 90 per cent of the average. But little hay has been cut and there will be more than an average crop. But few early potatoes were planted, but they are looking well. Yield of early market-garden crops good, prices good, and prospect for later ones good. But little variation in the quantity and price of dairy products and the supply and price of cows. Pastures are in better than average condition. Strawberries, blackberries and raspberries are not more than 75 per cent of last year's crop.

Norfolk (G. E. HOLBROOK).—Potato bugs are doing some damage. About the usual amount of corn has been planted but it is late and small. Haying has begun on light land and a fair crop is in sight. About the usual amount of early potatoes were put in but they are late and small. Early market-garden crops are not much raised. Good cows command high prices. Pasturage is in very good condition. Blackberries and raspberries winter-killed quite badly, strawberries rather scarce and selling well so far, wild berries doing well.

BRISTOL COUNTY.

Attleborough (ISAAC ALGER).—Potato bugs are doing some damage. Indian corn is small for the season but is now growing well; acreage about the same as last year. Haying has not begun but the crop promises to be up to the average. The acreage of

early potatoes is about the same as usual and the crop looks well though late. The quantity and price of dairy products and the supply and price of dairy cows is about the same as usual. Pasturage is in good condition. Strawberries are not fruiting as well as the bloom would indicate; apples very few. Rain is needed.

Mansfield (Wm. C. WINTER).—Potato bugs, green aphids and thrips on rose and grape vines are doing some damage. Less corn was planted this year than usual and that is very backward. Haying is not commenced except on a very small scale; crop looking well. The acreage of early potatoes is much less than usual and very few of them are above ground as yet. No market-garden crops harvested as yet. The quantity and price of dairy products and the supply and price of dairy cows compares well with former years. Pastures are in good condition. Strawberries, currents, blackberries, plums and cherries are looking finely; pears and apples light; no peaches.

Swansea (F. G. ARNOLD).—Owing to the wet spring corn is very late; the acreage is increased. Haying is late, with the prospect of a good crop. The acreage of potatoes is very much smaller than last year, but they promise well. Milk is plenty and price the same as last year, 28 cents per can delivered to the peddler; price of cows about the same as usual. Pasturage is in very good condition. Pears are plenty, peaches set well and apples fair.

Dartmouth (L. T. DAVIS).—Insects are doing the least damage for many years. Not nearly all the Indian corn is planted that will be, but that which is up is looking fairly well. Haying has not begun to any extent, and the crop promises to be a very good one. In this section early potatoes are almost an entire failure; acres have been plowed up, and some replanted. Early market-garden crops are almost an entire failure, others fair; prices perhaps a little better than usual. The quantity and price of dairy products are about as usual; price of cows perhaps a little higher. Pastures are in very good condition. Apples and some other tree fruits are hardly far enough along to tell what the result will be; strawberries fair, currants good.

Acushnet (M. S. DOUGLAS).—Currant worms are doing some damage. Corn is looking well, with a good color; acreage two-thirds of the average. Haying has begun and the crop is the heaviest for years. The acreage of early potatoes is larger than usual, and an average crop is promised. Yield of early market-garden crops not large but prices good, and the prospect is good for later ones. The quantity of dairy products is increased, with prices the same; price of dairy cows about as usual. Pasturage

is in fine condition. Strawberries are a good crop; plums extra; raspberries and currants average; apples and pears have dropped off very badly.

PLYMOUTH COUNTY.

Hingham (Geo. R. LOWE). — Rose bugs and potato bugs are doing some damage. Acreage of Indian corn about as usual, but the crop is about ten days late. Haying is just beginning, with the prospect of a large crop. There is a smaller acreage of early potatoes than usual, and they are all very backward. Market-garden crops are all late, with prices good at the present writing. No change of consequence in either cows or dairy products as to prices. Pasturage is in good condition as compared with former years. Strawberries are a short crop, owing to poor fertilization of blossoms, prices fair; plums and peaches heavily fruited; pears and apples light; blackberries and raspberries winterkilled badly and are short; grapes appear in abundance and look well; currants and gooseberries promise fairly well.

Hanover (H. L. HOUSE). — Potato bugs are doing considerable damage. Corn looks fairly well, but is later than usual; acreage about average. Very little haying has been done, but a heavy crop is promised. Rather less than the usual acreage of early potatoes has been planted, owing to wet weather at planting time. No marked change in the yield and price of early market-garden crops. The quantity and price of dairy products is the same as usual, and there is no marked change in the supply and price of dairy cows. Pasturage is in excellent condition. Apples, pears and peaches are excellent; strawberries are plentiful.

Duxbury (S. P. SOULE). — Potato bugs, pea vine lice and tent caterpillars are doing some damage. Corn is backward, much having to be planted over; acreage about the same as usual. Haying has not begun as yet; crop a little heavier than usual. Acreage of early potatoes less than usual but promising well; outlook for crop good. Early market-garden crops less in yield than ordinarily, price about as usual; later one looking well. Quantity and price of dairy products and supply and price of dairy cows about the same as usual. Pastures are in better condition than usual. Strawberries late but good, currants not filling out well, raspberries and blackberries average, peaches much better than usual, plums very good.

Halifax (G. W. HAYWARD). — Indian corn is small and backward, but mostly came up well; acreage the same as in previous years. Haying has hardly begun, and the prospect is bright for a good crop. Hardly any early potatoes were put in owing to the

wet spring. Prices of dairy products average as usual; price of cows same as in previous years. Pastures are in excellent condition. Strawberries are a fair crop, very few other berries.

Kingston (G. L. CHURCHILL).— Potato bugs and tent caterpillars are doing some damage. Indian corn is looking well but is rather late. Not much haying has been done as yet, but a good crop is promised. Early potatoes are rather late but are looking well. Market-garden crops are not yet ready for market but promise well. Supply of dairy cows about average and prices fair. Pasturage is in very good condition. Strawberries, blackberries and currants promise well.

Carver (J. A. VAUGHAN).— Potato bugs and tent caterpillars are doing some damage. But little Indian corn is raised here. Haying has not begun, but there is prospect of a good crop. Early market-garden crops are average in yield and price. Pasturage is in very good condition. Strawberries are very plenty; cranberry vines were winterkilled on some bogs, but aside from that are looking well and are well filled with buds.

BARNSTABLE COUNTY.

Bourne (D. D. NYE).— Tent caterpillars are doing some damage. Indian corn is looking well; acreage smaller than last year. Haying has begun with the prospect of from one-half more to double the quantity of last year. The acreage of potatoes compares favorably with previous years with the promise of a large crop. Early market-garden crops are fully average in yield and price. Quantity and price of dairy products fully up to former years, also prices of dairy cows. Pastures look in first-class condition. Strawberries are doing finely, huckleberries and blueberries bid fair for a good crop.

Falmouth (D. R. WICKS).— Potato bugs, squash bugs and cut worms are doing some damage. Very little Indian corn planted, acreage of sweet corn increasing and it is looking well. Very little hay has been cut but the prospect was never better for a large harvest. Early potatoes are late, just beginning to bloom; rather light tops but that may change later. Quantity and price of dairy products are about the same from year to year. Pasturage was never better. Currants have dropped off badly, strawberries have blasted somewhat and small fruits will not be very plenty.

Barnstable (JOHN BURSLEY).— Tent caterpillars, fire worms and canker worms are doing some damage. Corn is very late with the average acreage. Haying has begun and the crop will be much better than for the past two years, though not equal to the two

previous. Early potatoes are late but are growing quite fast now. Quantity and price of dairy products and supply and price of dairy cows is much the same as usual. Pastures are in good condition. Strawberries fair to good and cranberries looking fairly well for the time of year.

Dennis (JOSHUA CROWELL).—Tent caterpillars are doing some damage. Corn is looking well but is backward on account of late planting; acreage increased. Haying has begun and the crop will be a full average or better. Acreage of early potatoes about average; a fair crop is promised but later than usual. All early market-garden crops were more or less injured by the excessive rains. Not much difference in the quantity and price of dairy products from former years, but cows are perhaps a little higher than last year. Pasturage is in good condition. There is a medium crop of strawberries.

Orleans (F. E. SNOW).—Tent caterpillars are doing some damage. Little Indian corn is raised; late but looking well. There is a good crop of hay, and cutting is just about commencing. The acreage of early potatoes is about as usual, and a good crop is promised. Quantity of dairy products generally abundant, prices fair; supply and price of dairy cows about the same as usual. Pasturage is in better condition than for several years past. Very little has been done in the way of growing fruits for market, but they are generally looking well.

Wellfleet (E. S. JACOBS).—No corn is raised in this locality. A large crop of hay is expected, although none has been cut as yet. The acreage of early potatoes is about average, and the outlook for them is very favorable. Market-garden crops are very backward, but looking well. Price and quantity of dairy products is above the average. Pasturage was never in better condition in this neighborhood to my knowledge. The cold, stormy weather about blossoming time blighted fruit considerably, especially strawberries.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE).—Potato bugs, squash bugs and tent caterpillars are doing some damage. Indian corn is backward on account of being planted late; acreage about as usual. Haying is late, only a few having commenced, but the prospect is good. Potatoes were all planted late this year. Quantity and price of dairy products and supply and price of dairy cows are about average. Pasturage is in very good condition. Strawberries are late but good.

BULLETIN OF
MASSACHUSETTS BOARD OF AGRICULTURE.

A LESSON IN ECONOMICS: WHAT THE AGRICULTURE
OF THE TWENTIETH CENTURY DEMANDS.

By G. M. TWITCHELL, *Editor "Maine Farmer," Augusta, Me.*

The consideration of the question of economics imposes obligations on the writer or speaker not to be neglected, else failure is sure to result. It is easy to cry out against recognized practices, and, viewing the situation from the outside, bearing none of the weight of responsibility, criticise existing conditions and standards. At the same time, standing on the inside, conscious of the difficulties confronting, there is grave danger that established practices and habits may blind to the importance of open-eyed vision, of being watchful of all changes and prepared to adjust when good business suggests, or reconstruct when by reconstruction more is to be obtained. The fundamentals of all business remain the same; it is the adjustments which time is constantly modifying, and wise is he whose finger is on the pulse of trade to feel the variations and note intelligently their significance.

Agriculture forms no exception to the rule, and here, perhaps, is the lesson most difficult to learn. Life on the farm, the very conditions attending operations there, leads to deliberate action. One cannot thrust into the business the restless energy possible on State Street, Boston, and this deliberation may act as a barrier to the adjustment of methods and practices which the changing conditions of business first suggest and afterward render imperative.

Economy as applied to an industry must have a wide significance. It necessitates not only the completest elimination of waste, both in time, material and labor; it requires not only the readjustments of methods and products, with the sole thought of leading, not fol-

lowing, the market, but it imposes upon the manufacturer that watchfulness of events, that study of tastes and that constant contact, mental and physical, with moving currents, which alone can insure against loss.

The application is universal. The ruts of habit do not lead along the highway of progress. Large men, with vision sharpened by friction with the bustling activities of this new century, are as necessary on the farm as elsewhere. So much more is involved than simply to plow, plant, sow and harvest that the subject must be debated on a broader plane. It is easier to grow a crop or make a product than it is to realize the most from it in the market, yet every principle of economy demands that not only shall all waste in growing or manufacturing be prevented, but that there be no loss in disposing of what is produced.

He who faces agricultural problems in these days, when competition is growing sharper and ever-widening areas are filling our markets with the products of the land, must realize the complexity of the situation. The necessity for maintaining the agriculture of New England was never greater than at the present hour, and, rightly considered, the outlook improves in spite of the difficulties to be mentioned. At the same time the producer cannot hope for higher prices to rule, and therefore must study the field to ascertain, if possible, whether or not there is opportunity to reduce cost of production, improve quality, hasten maturity or increase quantity per head or per acre.

The farm producer is not exempt from the general law of business which imposes these same obligations on every one who would succeed. If, then, it be true that the principles of business govern here as elsewhere, the question may well be considered from a purely business stand-point.

How reduce cost of production? For the past quarter of a century this has been the query facing the manufacturer in every department of labor. That it might be compassed the inventive genius of the age has been searching, with fine mathematical adjustments, that construction of machinery which might reduce friction, do away with hand labor and increase product. The results attest the skill of the mechanic and the genius of the inventor. The farmer is to-day a manufacturer, in that the controlling conditions impose artificial relations and restrictions.

No man has yet compassed the capacity of machinery; no one realizes the power of nature to respond to an intelligent invitation. The milk maker who cannot tell what the product is per year for each individual cow is suffering from a loss of surprising magnitude, even though the average of the herd is above the cost limit.

We make superficial selections. A heavy flow when fresh is too often accepted as evidence of value, and three or four months' idleness at the end of the year are overlooked. In the majority of herds of twelve, where individual daily records are not kept, the loss caused by non-profitable cows may easily be reckoned at twenty-five per cent. That is, the range of production is so wide that, unless closely watched, one-quarter of the herd becomes a burden upon the pocket-book of the owner by dragging the total production below what it would otherwise be. No man can figure this loss or fix responsibility upon given animals save by the daily use of the scales and the careful record of each cow's production.

Milk making claims the attention of a large per cent of the farmers of New England. At two cents per quart, or practically one dollar per hundred pounds, the variations in the average herd are so wide as to astonish him who has not applied the individual test. This price means fifty dollars income from a cow producing five thousand pounds, and leaves little profit. It means eighty dollars for her mate, yielding eight thousand pounds yearly, — a good profit. The variations in many herds not selected by the scales range from thirty-five hundred to eight thousand pounds per cow, and the owner in such a case would be better off if he did a smaller business. To carry the illustration further, let us suppose that eight cows yield from six to eight thousand pounds of milk yearly, with an average of seven thousand. They would return seventy dollars per head, a total of five hundred and sixty dollars; also that the other four range from thirty-five hundred to five thousand, — an average of four thousand, — and we have as the total of the twelve cows seven hundred and twenty dollars, or an average of sixty dollars per head. Had the weeding process been applied and six thousand pounds established as the minimum, the profit would have been one hundred and twenty dollars more than at the present, for, be it remembered, these higher figures deal with profit entirely. If it costs fifty dollars per head to keep a cow, we have in one case a net balance over cost of keep of one hundred and twenty dollars and in the other of two hundred and forty. Supposing the four cows are removed from the herd and the production of the eight would return one hundred and sixty dollars net profit, and the owner is richer by forty dollars than with the twelve. This is a supposable case, but in a large number of herds as wide variations will be found and as great a per cent of cows not yielding enough to pay the bills for hay, grain, pasturage and ensilage.

The scales and record for three hundred and sixty-five days form the only reliable test, and the story these tell must be final with him who makes milk for market.

Another loss along the same line lies in producing five per cent milk for a four per cent market and standard. The standard established by law or agreement is to be met, but there is no reason why the producer should exceed that in value, and give something for which he obtains no equivalent. This calls for the selection of stock by the Babcock test. Milk and butter fat are the products of nerve force and it is this which exhausts vitality most rapidly. For this reason the producer must protect himself from waste by wise selection with reference to the work the animal is to perform. Economy here points to a conservation of nerve force, an item which receives far too little attention. We save at the spigot and waste at the bung when the principle here involved is not applied by the individual farmer to his individual animals.

The standard is to be met, but skill and care are called for not to exceed unless price is proportionately increased. Deliver what your contract calls for and then protect yourself from loss. In butter making the question rests solely on production of butter fat, with the same exactions regarding individuals. In both cases breeds become of secondary importance. A close study of the cost of the product desired from individual animals is the only way by which one can open the way to larger yield and less expense. Profitable cows are to be bred, not purchased. Herds are to be established, not picked up. The dominating will of an objective mind, filled with a high ideal of quantity or quality, alone can breed up to that standard of profit consistent with good business. Males are to be selected with sole reference to their virile energy and prepotent powers to transmit, in exceptional degree, the tendencies which under wise guidance, may be developed into fixed habits. Profitable dairy herds or animals are not accidents.

Viewing the problem from the business stand-point, the greatest saving in our milk or butter departments will come by a strict application of the law of selection of individuals, the sharp weeding out of non-profitable cows, the breeding of future herds from sires and dams of pronounced merit and the casting one side of all calves which do not give evidence of vitality and promise of great production. Color of markings plays no part in the consideration of the question from a milk or butter stand-point, but quality of hair and skin, evidence of udder, size and location of teats, looseness of tissue about the udder, thickness of abdominal wall and size of navel are points not to be passed over carelessly. Future cows will carry the evidences of worth at birth in udder structure and conformation, while the story of endurance may be read in the strength of the abdominal wall about the umbilicus. It does not pay to raise heifer calves upon a chance basis.

Breeders of pure-bred stock must follow sharply the requirements of the standard established by their associations, and combine fancy and utility, but the milk maker has the single standard of business by which to measure the individual heifer or cow. On my desk lies a letter from a milk maker, who in six years has built up the cows of his herd from six to nine, ten, twelve and thirteen thousand pounds of milk each per year. One cow, which gave 9,474 pounds in 1899, increased to 13,708 in 1900, and in 194 days, from Oct. 15, 1900, to May 1, 1901, yielded up 11,120 pounds. That she will break her record before October there is no question, and this upon a steady working ration for business, producing milk to sell at the factory from 80 cents to \$1.38 per hundred pounds, to test $3\frac{3}{4}$ per cent., the price being graded for the year, the average about \$1.12. This cow's milk brought her owner in 1900 \$157.03, and for the 194 days named, \$139.81. Every cow in this large herd over four years must yield yearly not less than \$100 at these factory prices or she goes to the block or market. The measure is by individuals and this insures profit.

The study of the food question is of equal importance with that of breeding. As conditions change, practices are to be modified. Supplemental foods must to-day be increased, that the ill effects of drought at any season of the year may be overcome. No shrinkage in product can be permitted which care and food might prevent. The silo for every day in the year promises to become a necessity with the milk producer, as by its use the feeder can control the inevitable changes of the season and supply succulent food to supplement the pastures or relieve the hay mow. The item of grain purchased is an important one with dairymen, and if, by the use of ensilage, Hungarian, oats, rye, barley or other succulent crops, a saving is possible, good business demands immediate action looking to an increase of these crops.

Still another question facing the grower of any crop is that of cost per ton, per bushel or per hundred pounds. In this are involved all the contingents of soil adaptability, soil cultivation, quality of seed and cost of fertilizer. That the question of soil adaptability to given crops is not appreciated there can be no doubt, and economy suggests more critical study. That cultivation plays a more important part than has yet been reckoned must be admitted. Marked results obtained by and through continued and complete cultivation demonstrate the importance of attention to this one important step.

The value of experimentation in the development of seeds to produce crops of fine quality and which will mature early must be admitted and the use of such must be depended upon by him who

would realize most. A few days' time in perfecting the crop may determine its profit or loss. Then, too, buyers are critical and their fancy forms the one standard which must control the grower. To fit the market most completely, and not fight it in the least, calls for a sharp and discriminating appreciation of the changing tastes of consumers. The universal appreciation of this condition and its liability to changes form one of the difficult problems the grower is obliged to face, yet he who keeps in closest touch with the palates of his customers and best pleases their epicurean tastes will be the one to realize most out of his growing crops. Last, but by no means least, in the consideration of this question, must be reckoned the fertilizer item, and, whether one purchases the elements to combine himself or obtains his supply in the open market, the labors of the manufacturer must be recognized. Dependent as we so largely are upon the market for the supply of plant food, the services of the scientist in fixing values and determining what single or combined fertilizer promises to give the best results with any given crop must be relied upon more and more by him who studies the economies of the question and seeks to feed for most complete results. The day has passed for blunderbuss methods of fertilization, and skill and care are demanded in the selection of the elements wanted for any given crop.

Right here may well be enforced the old lesson of saving and utilizing the natural accumulations about the barns, yards, cess-pools and sink spouts. Thousands upon thousands of dollars are lost yearly by the farmers of every State through failure to properly save the solids, and especially the liquids, from the stock, protect from leaching under the eaves, and hold by the free use of absorbents the accumulations everywhere, that out of all these we very largely increase the crop-producing power of the land. The most intelligent use of the combined fertilizer on the market will be secured by him who, through skill and economy, utilizes to the utmost the wastes about the farm.

One of the growing industries in New England, and one to be fostered in every way, is that of poultry culture; yet there is in no field such neglect of the principles of economy as here. Men forget that breeds are simply the result of the painstaking care and skill of individual enthusiasts and that unless held to the level of large production by the well-defined purpose of the breeder, they revert rapidly to their natural state. The experiment lately made at the Maine Experiment Station reveals the situation facing every grower. By careful supervision it was found that while the best layer in a flock of ten produced over two hundred eggs in a year, the worst loafer produced but thirty-six. This suggests that fifty

per cent of the flocks, save perhaps the Leghorns and Minorcas, might be wiped out of existence and greater profit realized by the State. We carry altogether too much dead wood in our poultry yards. From the close of the hatching season until it opens again, males are a positive injury in the flock. Their sole value lies in their power to fertilize eggs, and fertilized eggs, outside of the hatching season, are an abomination. Consumers want fresh eggs, and as decay commences in the dead germ, the importance of non-fertilized eggs for the market must be realized. Eggs from hens running free from males will, if cared for, keep fresh nearly twice as long as the same eggs fertilized. Poultry should be made to play a more important part in fertilizing the crops, and by floorings under the roosts and the sweeping of the droppings daily into a pail or basket where they can be carried to a dry storeroom and mixed with dry earth, muck or plaster, a most valuable fertilizer will be obtained.

No hen should be kept after two years old unless wanted solely as a breeder, and it is better to send to market at the close of the first year's laying season. A sharp distinction may well be made between keeping a flock from which to breed and one simply to produce eggs for the market. In the multiplicity of breeds there is danger of losing rather than gaining, all depending upon the appreciation by the individual breeder. We have reached a point where production in good-sized flocks should exceed twelve dozen per head yearly. This can be realized only by a sharp weeding out of the one hundred egg hens. It practically costs as much to keep a six dozen as a twelve dozen hen. If our flocks were cleared of all surplus males and worthless females, of all old, sick, infirm and valueless stock, the saving would be enormous. Many a flock of hens is being kept at no profit simply because their owner is loading the producers with a burden of waste stock which eats up all the profit.

In all breeding we have first the tendency, then the habit; the habit follows the tendency, and therefore it is in the earlier state that control is easiest and most successful. In spite of this, the great majority of flocks grown this year will be allowed to run together, males and females, with the one thought of size and fat on the part of the males, forgetting that the pullets mature earlier, that fat is an obstacle to egg production and the natural tendencies are unconsciously being turned into habits of fat forming. Viewing the question as an economic problem, these conditions are all to be noted as helps or hindrances to success. Grow the cockerels for the end you desire them to reach, but think of every pullet as a possible profit bearer to you and let her mature with no thought

but of strengthening the natural functions of egg production. There are some things which may be forced but these are all crude or mechanical. All the higher and finer products come by invitation. This applies equally to the fruit or vegetable grower and the horticulturist as to the crop producer and feeder.

Another important step which economy dictates is that of protecting stock, crops and fruit from myriad pests and diseases. That this imposes severe obligations there is no question, but it offers the only economic solution of the difficulty. Healthy animals, plants and growing crops alone can return the largest yield and finest quality. More sunlight and fresh air in the tie-ups will retard the activity of disease germs, better protection from flies increase the flow of milk. Whatever destroys any portion of the leaves on the growing plant or tree, destroys also its power to reproduce in largest quantity or to mature to greatest perfection. Thus the spray pump, the insecticide, the fungicide and bug destroyer, the solution to prevent scab, and any and all agents which, intelligently used, enable the plant or growing tree to completely mature its fruit or seed are absolutely necessary from a purely economic stand-point.

Rural life, while it insures fixedness of ideas and principles, needs the friction of contact to vitalize into positive action, and this suggests the importance of the agricultural press, the bulletin, the institute, work of the Board of Agriculture and the grange. It must be true that he who rises to the fullest grasp of the situation confronting to-day utilizes all possible helps, seeks all avenues of assistance. So many conflicting agencies are at work that there is forced upon the individual the imperative need of allying himself with every agency which can in any way promote his prosperity. It is economy to avail oneself of the assistance of these agencies ; it is waste to refuse. So long as these fill their sphere, stimulate thought and arouse ambition, they are helpful in the extreme. This is their mission. No industry can thrive to-day without its representative publication. A live farm paper, aggressive, fearless, outspoken and sound, is a positive necessity in the home of every man who would fill his place as a producer and salesman of the finer products of 1901. By and through it alone can he keep touch with moving currents of trade, watch over the changing markets and have brought fresh to his door the work being accomplished by the scientist and student. The bulletins and reports of the Board constitute a library of agricultural thought, investigation and results too valuable to be lost by any tiller of the soil.

The institute for the discussion of live questions of vital importance to the community has long been recognized as a potent factor

in every State, yet to be of greatest value it must claim the attention and command the presence of every man who tills a farm. Its province is the presentation of live agricultural problems in a manner not to confirm past practices but stimulate thought and provoke discussion. He who denies himself the privileges and benefits of the well-conducted agricultural institute is a loser in the struggle of to-day. The institute must be made of greater service, its mission needs be more clearly defined and appreciated, its discussions claim the attention of a wider circle.

The grange is so interwoven with the social, educational, agricultural and home life of New England that there can be no fair analysis of existing conditions which does not include the work of this organization. Its field is peculiar. It cannot take the place or do the work belonging to any other agent. It holds by the bonds of sentiment, it helps by kindling enthusiasm. It must ever be the ally of every agent set for the promotion of the farm home and home farm, and for these reasons every consideration of economy should urge the individual farmer to unite in this farmers' organization for those enduring results which are not to be obtained through any other channel. A live, earnest, working grange, loyal to its declarations of principles, is one of the strongest promoters of fidelity and enthusiasm the country home can have.

May it not be that the evident drift of all forms of business into what are termed trusts furnishes a good illustration of that spirit of practical co-operation which must extend over the farms before the avenues of waste can be checked? The writer is familiar with a section fifteen miles from market where ten farmers living on one road and in one school district spend one day every two weeks in going to market with their butter, cheese, eggs, potatoes, etc. One man could do the business for the whole by going weekly, as each has his regular customers. The loss to this school district amounts to two hundred and eight days yearly, less the extra expense to be paid for delivering.

The manufacturers have accepted the inevitable lesson and combined. Why should not the farmers? The principle is sound. Its application may be extended in many directions. It must come in the not far distant future in order that all that is possible may be realized from their labors. It suggests almost limitless possibilities along the lines adopted by our corporate interests.

Economy is not parsimony, and therefore to realize most one must expend wisely. My thought is that good business demands the application of the same spirit of enterprise by the farmer as by the manufacturer. If a new machine will do more and better work than the old, reducing cost in any direction, its purchase is

economy. Many a man has gained by setting one side a five-foot mower and buying a longer cut. The value of all machines must be gauged by results. Hand labor is more and more to be superseded by machinery, but this necessitates larger operations that the relative profit may not be reduced. It reduces labor in one direction that more may be done in another. These labor-saving machines are not intended to relieve the brain but the hand. The man saves physical force that he may expend mental, and out of this expenditure obtain what formerly was impossible.

A large item of loss on many farms is the time necessary to move from field to field in order to complete any given work, and the same lesson applies with equal force to the majority of manufacturers. We turn too many short furrows, cultivate too many fractions of an acre, travel over too much territory to grow our crops. Economy suggests the massing of land under the plow and the systematic going over the whole farm by a short-term rotation.

Standing one day recently, looking over the well-tilled fields of a middle-aged farmer, there could be counted ten lots of land under the plow, scattered all over the farm, four or five of which covered considerably less than an acre each. If these could have been in one lot the saving of labor in cultivation and travel would be no mean item. Asking a Kansas corn grower how he made money, his reply was, "By the length of the corn rows." He reduced loss of time and labor to the minimum.

Discussing this question from a purely business stand-point with reference to the economies possible these are a few which are suggested. They all or nearly all apply with equal force to other lines of labor, and only illustrate the fact that occupation does not settle the question and that waste is universal. At the same time here are some of the steps which may be taken to still further reduce the cost of production and leave in the pocket of the producer the evidence of a more satisfactory year's business.

Asking of nature that she return in ever-increasing ratio and in constantly improving quality, there come correspondingly increasing obligations upon the grower and producer which must be appreciated and observed. Discussing the situation from the business side, with special reference to reducing cost of production, these important considerations present themselves with a force not to be lost by the thinking producer.

The wastes which must be eliminated before the industry reaches its higher levels are not alone along the lines already suggested but bear a direct application to the individual farmer. To-day the successful farmer is not only a mechanic but an artist; he realizes the necessity for reducing the cost of production, and, to a degree,

of frictionless machines, whether animate or inanimate, but to succeed he must have an artist's outlook, he must see clearly before him the perfected crop, the ideal structure in the animals constituting his herd, and pronounced individuality in each necessary for large service; and with this large, full appreciation there will be wanted the same unbounded enthusiasm found in the ranks of the mechanic, the tradesman or the specialist.

Here is the field for future operations. Men succeed not solely out of intuitive preceptions but because these have been sharpened and made critical through study and investigation, because they have grown into large comprehension of underlying principles, and, by the force of a dominant will, intelligently invite their flocks and herds out into ever-broadening fields of service. Here is the demand for economy of nerve force on the part of the producer; here the opportunity to make the conscious and unconscious forces of nature yield greater returns; here the field wherein waste forces are to be utilized, sympathetic relations established and our agriculture made real, positive, strong, invigorating and attractive to the coming generation.

MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF JULY, 1901.

ISSUED BY

J. W. STOCKWELL,
SECRETARY STATE BOARD OF AGRICULTURE.

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CROP REPORT FOR THE MONTH OF JULY, 1901.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Aug. 1, 1901.

Bulletin No. 3, Crop Report for the month of July, is herewith presented. Attention is called to the article at the close of the bulletin, on "Selection and Improvement of the Dairy Herd," by Prof. F. S. Cooley, professor of animal husbandry and dairying at the Massachusetts Agricultural College, which we would commend to the attention of our readers, and particularly those who are interested in the production of milk and butter.

PROGRESS OF THE SEASON.

The July returns of the United States Department of Agriculture (Crop Reporter for July, 1901) state that the preliminary returns on the acreage of corn planted indicate a reduction of about 400,000 acres, or .5 per cent from the area planted last year. The average condition of the growing crop July 1 was 81.3, as compared with 89.5 last year, 86.5 in 1899, and a ten-year average of 90.3. In the 22 States having 1,000,000 acres or upwards the condition is more or less below their ten-year averages, except in Mississippi, Virginia and South Dakota, where the conditions correspond with their ten-year averages.

The condition of winter wheat improved during June, being 88.3 on July 1, as compared with 87.8 on June 1, 80.8 on July 1 of last year, 65.6 in 1899, and a ten-year average of 80.2. The average condition of spring wheat also improved during the month, being 95.6 on July 1, as compared with 92 a month earlier, 55.2 on July 1 of last year, 91.7 in 1899, and a ten-year average of 85.6. The condition of spring and winter wheat combined was 91.1, against 69.8 on July 1 of last year, and 76.2 in 1899. The

amount of wheat remaining in the hands of farmers on July 1 was estimated at about 31,000,000 bushels, or the equivalent of 5.85 per cent of the crop of 1900.

The average condition of the oat crop was 83.7, as compared with 85.3 on June 1, 85.5 on July 1 of last year, 90 in 1899, and a ten-year average of 87.7.

The average condition of barley was 91.3, as against 91 on June 1, 76.3 on July 1 of last year, 92 in 1899, and a ten-year average of 87.1.

The average condition of winter rye was 93.6, as compared with 89.6 on July 1 of last year, 83.3 in 1899, and a ten-year average of 89.2. The average condition of spring rye was 93.3, as compared with 69.7 on July 1, 1900, 89.7 in 1899, and a ten-year average of 87.3.

There is an indicated decrease of some 60,000 acres, or 2.3 per cent, in the acreage of potatoes. The average condition was 87.4, as compared with 91.3 on July 1, 1900, 93.8 in 1899, and a ten-year average of 93.1.

The sweet potato reports were rather unfavorable, a majority of the more important producing States showing conditions more or less below their ten-year averages.

Reports on the hay crop were in the main unfavorable, there being a decline from the condition as reported on June 1 in a majority of the more important hay-producing States. The condition of pastures suffered impairment during the month, and in several important States was considerably below the ten-year averages.

While there was a general decline in the condition of apples and peaches as compared with a month earlier, almost every important peach-growing State has the promise of more than an average crop, but in the apple-producing States the crop will be generally poor. The condition of grapes was excellent.

The average condition of cotton on June 25 was 81.1, as compared with 81.5 on the 20th of the preceding month, 75.8 on July 1, 1900, 87.8 in 1899, a ten-year average of 86.3, and a fifteen-year average of 87.5.

In Massachusetts the acreage of corn as compared with last year was 100, and the average condition July 1, 86; the average condition of oats, 92; the average condition of

barley, 90; the average condition of spring rye, 103; the acreage of potatoes, 97, and the average condition, 87; the average condition of tobacco, 87; the average condition of clover, 98; the average condition of timothy, 100; the average condition of pasture, 101; the average condition of apples, 66; and the average condition of grapes, 95.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM THE UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending July 1.—The week was excessively warm throughout the central valleys, Lake region, New England and middle Atlantic States, and over the northern portion of the Gulf States. In California the week was also warmer than usual. Along the south Atlantic and Gulf coasts the temperature conditions were nearly normal, and over the middle and northern Plateau regions and the north Pacific coast the week was decidedly cool. The maximum temperatures of the week were unusually high in the central valleys, Lake region and New England, where many stations reported the highest yet recorded for the last decade of June. Heavy rains fell over the greater part of the upper Lake region, including portions of the upper Mississippi and Ohio valleys, and more than the usual amount occurred over limited areas in the Gulf and south Atlantic States. Over much the larger part of the country, however, the week was very dry.

Week ending July 8.—The week was excessively warm throughout the central valleys, Lake region and the middle Atlantic coast districts, with temperatures averaging above the normal in the Gulf States and over the Eastern Rocky Mountain slope and eastern portion of the Plateau region. The excess of temperature was most marked in the middle Atlantic States and lower Missouri valley, where the records for the first decade of July were broken at many stations. In southern Florida and on the immediate coast of South Carolina and Georgia and southern Maine there was a slight deficiency in temperature, and the week averaged cooler than usual in all districts on the Pacific coast. Heavy rains fell in portions of the middle Atlantic States and New England, Lake region, Minnesota, North Dakota, eastern Montana,

over portions of the central Missouri valley, in Florida, along the immediate central and east Gulf coasts, and over local areas in the Ohio valley. Over the greater part of the central valleys, Gulf and south Atlantic States the weekly rainfall was below the average.

Week ending July 15. — The week was intensely warm in the Missouri and Mississippi valleys, eastern portion of the upper Michigan Peninsula, over the central Rocky Mountain region and northern portion of the west Gulf States, it being the third consecutive week of excessive heat in these districts. Nearly normal temperatures prevailed in southern Texas, Florida, the Ohio valley southern New England and over the western portion of the Plateau region. The week averaged cooler than usual in the central and northern Pacific coast regions. Maximum records for the first and second decades of July were broken at a large number of stations throughout the Mississippi valley and in portions of the Gulf States, upper Lake region, lower Ohio and lower Missouri valleys. Abundant rains fell along the Atlantic coast from New Jersey southward to northern Florida. Showers fell over local areas in portions of the central Gulf States, upper Lake region and portions of Montana, Wyoming, Colorado and Utah. Generally throughout the central valleys there was little or no rain.

Week ending July 22. — The week was intensely warm throughout the central valleys, northern Rocky Mountain districts, Lake region, northern portion of the middle Atlantic States and New England. Nearly normal temperatures prevailed over the southern portion of the middle Atlantic States, along the Gulf coast and over southern Plateau districts, while the week averaged cooler than usual on the south Atlantic coast and generally throughout the Pacific coast districts. Heavy rains occurred in the Carolinas, Florida and over portions of Georgia, Alabama, Mississippi, Louisiana and eastern Texas, and the greater part of New England and the middle Atlantic States received showers giving from one-quarter to more than one inch. Throughout the central valleys the precipitation was below the average and was generally very light. Over a large part of the central valleys there was no appreciable rainfall.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending July 1.—New England. Boston: Crops improved; weather very warm and dry, and unless rains come soon crops will suffer; haying begun, generally average or above average crop; pasturage drying in central-southern portion, and dairy interests suffering.

Week ending July 8.—New England. Boston: High temperatures and showers improved crops, especially corn and potatoes; haying continued in southern and beginning in northern States, large crop promised; apples promise small yield, especially winter varieties, other fruits plentiful.

Week ending July 15.—New England. Boston: Cloudy, with showers first part of week, fair last three days; crops improved, especially corn, potatoes and tobacco, but hay harvesting retarded; small fruits plentiful; peaches good in some sections; apples small crop; rain needed in Vermont and southern States.

Week ending July 22.—New England. Boston: Weather very warm; favorable for all crops; excellent for haying; corn late but promising; potatoes late, short crop; tobacco fair, condition improving, some injury from hail; small crop of apples promised, dropping continues; other fruits plentiful; rain needed in southern section.

THE WEATHER OF JULY, 1901.

The excessive heat which prevailed at the close of June continued through the first three days of July, making eight days during which the maximum temperatures rose to 90 degrees or above. According to the official reports of the Weather Bureau at Boston this excelled all previous records, covering a period of twenty-nine years, the largest number of successive days heretofore with a like range of the mercury being six, from June 24 to 29, inclusive, in 1880. The temperature ruled high throughout the month, and was by far the most conspicuous feature of the weather of the month. From the 4th to the 13th the daily means did not depart greatly from the average for that period of the month, but from the 14th to the 24th the daily excesses ranged from 6

degrees to 13 degrees above the normal. There was a marked drop in the temperature on the 25th, and the weather continued cool for several days, followed by slowly rising temperature, and the conditions at the close were near the seasonal. Taken as a whole, the daily mean temperature was about two degrees in excess of the average July. Excepting the temperature, the weather of the month was very pleasant. Showers occurred quite frequently and were generally well distributed over the State. With slight exceptions the amounts were moderate to copious. For the larger portion of the district the monthly precipitation was somewhat in excess of the normal. There were, however, scattered sections which the rains did not reach, chiefly in eastern portions of the State, and where there was some complaint of drought. Nevertheless, it is not believed that the absence of rain was sufficiently marked to cause injury to vegetation or growing crops. Moderate to heavy rains occurred on the 11th and 12th and again on the 25th and the night of the 28th, but the precipitation for the remainder of the month consisted of local showers. Some sections were visited by severe local storms, in which high and destructive winds occurred, and in a few instances hail storms were reported. These resulted in more or less damage to crops and buildings. Viewed as an entirety, the weather of July was pleasant and characteristic of the month.

In the circular to correspondents returnable July 23 the following questions were asked : —

1. What insects are proving most troublesome in your locality?
2. What is the condition of Indian corn, and what proportion of the crop will be put into the silo?
3. What is the quantity and quality of the hay crop as compared with former years?
4. What forage crops are being raised to supplement the hay crop, for the silo and to eke out the pastures? What is their condition, and are more raised than usual?
5. What is the condition of market-garden crops, including potatoes, and how have those already harvested compared in yield and price with former years?

6. What is the prospect for apples, pears, peaches, plums, quinces, grapes and cranberries?

7. What is the condition of pasturage in your locality?

8. How have rye, oats and barley compared with former years, both as grain and forage crops?

Returns have been received from 163 correspondents, and from them the following summary has been made up:—

INSECTS.

Potato bugs appear to be rather more numerous than in ordinary years, and in numerous localities are reported as doing considerable damage. Squash bugs also appear to be more than commonly prevalent, and squash vine borers, while not reported by many correspondents, are spoken of as having done much damage where they have appeared. Eleven correspondents, from widely separated parts of the State, report the presence of the elm leaf beetle. Other insects mentioned are cut worms, tent caterpillars, currant worms, cattle flies, grasshoppers, tobacco worms, rose bugs, pea-vine lice, horn flies, plant lice, curculios, gypsy moths, cabbage worms and canker worms.

INDIAN CORN.

The hot weather of the month brought Indian corn forward very rapidly, and at the time of making returns it was generally in good condition and growing fast. Since then the general rains must have still further improved the condition. Silos gain in favor constantly but slowly, and are most used in the dairy counties, particularly Worcester County, and least in the southeastern section of the State.

THE HAY CROP.

Haying was later than usual, owing to the press of farm work at the time haying begins on most farms, but at the time of making returns there was little left to be cut. The crop was much larger than for the past two years, but it is doubtful if more than an average crop was secured for the State as a whole. The quality of the crop was generally good, though much of the later cut was injured by showers.

FORAGE CROPS.

Returns point to an increase in the acreage of forage crops, which, taken with the fact of a good hay crop, would seem to indicate increased interest in and attention to these crops. Fodder corn is the crop most extensively raised for the purpose, followed by oats, millet, Hungarian grass and barley, in the order named. Other crops mentioned are peas and oats, peas, rye, soy beans, buckwheat, vetch, wheat, mangels and sugar beets. They were generally reported to be in good condition, which condition undoubtedly still maintains.

MARKET-GARDEN CROPS.

The hot weather of the early part of the month injured early market-garden crops very severely, but the recent rains have been most beneficial to later ones, and with seasonable rains in future they should do well. Prices for early crops were rather higher than commonly.

EARLY POTATOES.

The cold, wet spring so delayed potato planting that at time of making returns very few early potatoes had been dug. It is therefore impossible to give any definite information as to the yield or the prices received. The hot, dry weather did considerable damage to the early crop and it is very doubtful if an average yield is secured. Later planted fields should do well, but the planting came with such a rush that there will hardly be the usual difference in the time of harvest.

FRUITS.

Apples dropped badly during the month, still further reducing the already light crop. Pears and peaches promise only light crops. Plums were reported as dropping badly in some sections, but a fair crop is still expected. Quinces are good as far as reported on. Grapes promise well. Not enough returns were received in regard to cranberries to warrant an opinion as to the probable yield.

PASTURAGE.

Pasturage got a good start in the spring and came through the hot, dry weather surprisingly well. The showers came most opportunely in most localities, and with the recent rains pastures should be in the best of condition at the date of issue.

SMALL GRAINS.

Rye was a fair average crop, but oats are generally off in condition, with numerous complaints of rust. Barley is little grown, except as a forage crop, and in that capacity promises well.

NOTES OF CORRESPONDENTS.

[Returned to us July 23.]

BERKSHIRE COUNTY.

Sheffield (DWIGHT ANDREWS).—Potato bugs were never as plenty as now. Indian corn is looking well but is late; fully half the crop will go into the silo. Hay was a good crop as to quantity, but the quality was a little off. Corn is the principal forage crop grown and more than usual is being raised. Potatoes promise a full average crop. The prospect for all kinds of fruit is very poor in this section. Pasturage is in good condition for the time of year. Rye, oats and barley are good average crops.

Monterey (W.M. S. BIDWELL).—Potato bugs, cut worms and tent caterpillars are doing some damage. Corn is in good condition and only a small amount will go into the silo. The hay crop is much better than last year. Oats are the principal forage crop raised to supplement the hay crop and are in good condition, more being raised than usual. Market-garden crops are in poor condition; prices good, yields very small. Fruit is scarce. Pastures are in good condition. Wild berries are very plentiful.

Lee (A. BRADLEY).—Indian corn is nearly average in condition; one-fourth the crop will go into the silo. The quantity and quality of the hay crop is fully up to former years. Corn is the principal forage crop grown, is nearly average in condition, and more is being raised each year. Apples promise a little over half a crop and grapes nearly a full crop. Rye is in very good condition.

Stockbridge (F. A. PALMER).—Potato bugs are very numerous this season. Corn was planted late but is doing finely; about one-fourth of the crop goes into the silo. Hay is not an average crop in quantity or quality. Corn is the principal forage crop grown, is doing well, and more is raised each year. Potatoes are small and in need of rain. Very few apples; pears fair; a few peaches and quinces; plums fair. Pasturage is in good condition. Rye is good; oats are rusty and will be a light crop. Old meadows

show a poor crop of hay and white and yellow daisies are coming in very thick as the grasses die out.

West Stockbridge (W.M. C. SPAULDING). — Potato bugs, squash vine borers, currant worms and elm leaf beetles are doing damage. Indian corn is in good condition; no silos here. Hay a medium crop as to quantity but of good quality. A little sowed corn is raised as forage and looks fairly well. Potatoes look fairly well, but are greatly in need of rain. Apples very light; pears few; grapes fair. Pasturage has been excellent but needs rain soon. Rye, oats and barley are fair crops, though oats are short in straw and heading out lightly on account of dry weather.

Hancock (C. H. WELLS). — Potato bugs are doing some of their best work. Corn is looking very well, considering the backward start in the spring. The hay crop is a full average one of good quality. Sowed corn is looking well and is about the only forage crop raised. Potatoes are looking finely and promise a good yield. Early apples plenty, late ones scarce; pears few; plums an abundant crop; grapes promise well. Pastures are in better condition than usual at this time. The oat crop is slim; very little rye and barley raised.

Windsor (W. H. TIRRELL). — Potato bugs are doing some damage. Indian corn is in good condition and a large proportion of the crop will be put into the silo. Hay was more than an average crop as regards quantity. Corn and millet are the principal forage crops grown and they are looking well. Potatoes are in poor condition and bring a high price. There will be a fair crop of fruit. Pastures are in good condition.

Savoy (W. W. BURNETT). — Potato bugs, squash bugs and cattle flies are doing some damage. Corn is looking well and growing fast; about half of the crop is for the silo. The hay crop was more than an average one for quantity. Corn and oats are the principal forage crops grown. Market-garden crops and potatoes do not promise as well as usual. There are few apples; other fruits not extensively grown. Rye, oats and barley are less than average crops. The greater part of the hay crop is as yet uncut and the quality is thought to be a little off.

Williamstown (S. A. HICKOX). — Potato bugs are very plenty. Corn is growing fast but is uneven, owing to there being several plantings in the spring. Hay is a good average crop as to quantity and of good quality. Corn is the principal forage crop grown and more is being raised for that purpose than usual. Market-garden crops are late but look well; potatoes will be a very light crop. Pasturage is in good average condition. Rye good; oats rusted badly; barley good.

FRANKLIN COUNTY.

Monroe (D. H. SHERMAN). — Potato bugs are more numerous than ever before. But little Indian corn was planted and it is late, but will be all right for the silo, for which most of it was designed. Hay is a fair average crop, but rust has appeared in places so as to affect the quality. Japanese millet, oats, peas, barley and corn are the forage crops raised; they are late and more are raised than usual. No market-garden crops harvested; potatoes looking well but late. Few apples; no peaches or pears; some plums and grapes; cranberries blossomed full. The hot weather is pinching pastures, as we have had no showers. Rye, oats and barley fair crops; all raised for forage.

Leyden (U. T. DARLING). — Potato bugs are our most troublesome insect. Corn is looking well but is a little late; probably two-thirds of the crop will go into the silo. The hay crop is good, both as regards quantity and quality. Corn and oats are the principal forage crops raised. Potatoes have suffered badly from potato bugs. Very few apples; no peaches; pears, plums and grapes very good. Pasturage is looking fairly well. Rye, oats and barley compare favorably with former years.

Buckland (C. E. WARD). — There is very little trouble from insects. Indian corn is late, but is coming forward rapidly; more than half the crop will go into the silo. Quantity of the hay crop in excess of past two years; quality fair. Hungarian grass, oats and barley are the principal forage crops grown. No market-garden crops are raised; potatoes late and none harvested. Fruit of all kinds will be poor. Pastures are in good condition. Rye, oats and barley are not raised for grain, and promise about as usual for forage.

Deerfield (CHARLES JONES). — Potato bugs are doing some damage. Indian corn is late but growing fast, and one-tenth of the crop will go into the silo. Hay is about an average crop of fair quality. Forage crops of any kind are not much raised. Market-garden crops are in good condition; potatoes look well, but none have been harvested as yet. Apples will be a small crop, also pears and grapes. Pasturage is not up to the average in condition. Rye and oats are better than average crops. Tobacco is late, but is looking well and growing fast.

Sunderland (J. M. J. LEGATE). — Cut worms have done more than the usual amount of damage to tobacco this year. Corn is rather late but is growing fast and looking nicely; over half the crop will go into the silo. The hay crop is above the average, but quite a good deal has been damaged by the catching weather we

have had while securing it. Corn is the principal forage crop grown, and there is also a very little millet raised. Market-garden crops are late with average yields and prices. Potatoes will be less than an average crop, but bring high prices now. There will be a short crop of fruit, with the exception of plums, which promise a heavy yield. Pastures are in good average condition. Rye, oats and barley are little raised.

Montague (C. S. RAYMOND). — Potato bugs are doing some damage. Indian corn is making good growth but is late; half the crop will go into the silo. Hay is only a normal crop, but its quality is very good. Oats and peas and corn are the principal forage crops and are being grown in about the usual quantity. Market-garden crops are in fair condition; potatoes a light crop with the price somewhat higher than usual. Fruit of all kinds will be very poor. Pasturage is in fair condition. Rye, oats and barley are little raised.

Wendell (N. D. PLUMB). — Potato bugs are doing more damage than for years. Corn is somewhat backward but looks A 1; about three-fourths of the crop will be put into the silo. Hay was a somewhat better crop than usual, especially new seeded fields. Hungarian grass and barley are the principal forage crops grown and there is an increase of 50 per cent in the acreage this year. Potatoes are somewhat backward. Fruit will not give more than a one-fourth crop. Pastures are in very good condition now, but need rain. Rye, oats and barley are about normal crops.

New Salem (DANIEL BALLARD). — Potato bugs, currant worms, and in some places an insect which attacks the maple trees, are doing damage. Indian corn is in good condition; only a small portion of the crop will go into the silo. Hay is above the average in quantity and is of excellent quality. Corn, oats, Hungarian grass and some barley are raised for forage, in the usual quantities. But few market-garden crops are raised, excepting potatoes, which are backward and none harvested. Light crop of apples and peaches; pears more plenty. Pastures are in very good condition, though the present hot, dry weather is injurious. Rye and oats have been good crops; but little barley is grown.

HAMPSHIRE COUNTY.

Greenwich (WM. S. DOUGLAS). — Potato bugs are doing some damage. Indian corn is in fair condition and only a very small proportion of the crop will go into the silo. The hay crop was much larger than last year. Oats are raised for forage to a small extent. Market-garden crops, including potatoes, are later than

usual. The prospect for fruit of all kinds is not very promising. Pasturage is in good condition.

Enfield (D. O. CHICKERING). — Potato bugs and rose bugs are doing some damage. Corn is quite backward but is growing fast now; not much of it will be put into the silo. Hay is above the average in quantity and quality. Oats, Hungarian grass and corn are the principal forage crops grown. Market-garden crops, including potatoes, are about average; prices a little better than usual. Pears, plums and grapes promise well; apples a light crop. Pastures are in good condition. Rye, oats and barley are about average crops.

Belchertown (H. C. WEST). — Potato bugs have not been as troublesome for years as they are at present. Corn is late, but is making a great growth and now bids fair to be a full average crop; very little for the silo. Hay is a fair average crop, not as large as was expected a month ago. Fodder corn, millet, oats and barley are the forage crops raised and are all looking well; acreage greater than usual. Market-garden crops are little raised; no potatoes harvested as yet. Apples half a crop or less; pears, peaches, plums and grapes fair. Pastures are short but green. Rye and oats are good crops; barley just coming up and looks well.

Hadley (H. C. RUSSELL). — Potato bugs and squash bugs are more plentiful than usual. Indian corn never looked better and has improved greatly in the past two weeks; only a small per cent will go into the silo. The hay crop is much better than last year, but haying is later than usual and much of the crop is too ripe. Hungarian grass and sowed corn are the principal forage crops grown. Early potatoes will be a very poor crop. Market-garden crops much below the average with prices good. There will be only a medium crop of fruit. Pasturage is in good condition. Rye, oats and barley are about average crops. Onions are looking well. Tobacco has grown very fast since the rains.

Southampton (C. B. LYMAN). — Potato bugs are doing some damage. Corn is looking first rate; only a small part goes into the silo. The hay crop was not as large as some years, but the quality was good. Corn, oats and millet are the principal forage crops grown; oats the poorest for years. Potatoes look the poorest for years. There will be a light crop of fruit, except grapes, which promise well. Pastures are in very good condition. Rye is a good crop; have not seen a good field of oats. Cabbage are looking finely.

Chesterfield (HORATIO BISBEE). — Potato bugs are more numerous than ever before. Corn is in good condition and one-fourth the crop will go into the silo. Hay was less than an average crop,

but the quality was good. Corn, Hungarian grass and oats are the principal forage crops grown; condition good and more raised than usual. Early potatoes are nearly a failure. Small crop of apples; small fruits not much raised. Pasturage is in fairly good condition. We are suffering for want of rain, although there has been plenty in adjoining towns.

Plainfield (S. W. CLARK). — Potato bugs and squash vine borers are doing considerable damage. Indian corn is a little late, but is strong and vigorous. Hay was a heavy crop, nearly twice that of last year, and of fair quality. Forage crops are not raised as much as last year, hay being abundant. No early potatoes have been dug as yet. Apples have dropped badly for some time, and last night a shower, with a heavy wind, blew off what remained on the trees. Pasturage is in very fine condition. Rye, oats and barley are normal crops.

Middlefield (J. T. BRYAN). — Potato bugs are about the only insect doing damage. Corn was planted very late, but is growing rapidly; nearly half the crop will go into the silo. Hay was about an average crop of excellent quality. Sweet corn, oats and barley are the principal forage crops grown. Market-garden crops are late, but are growing rapidly. There is not much fruit of any kind. Pasturage is in good condition. Rye, oats and barley are good crops, but will all be cut for forage.

HAMPDEN COUNTY.

Tolland (E. M. MOORE). — Potato bugs are very numerous. Indian corn is late, but the warm weather has started it growing rapidly; only a small proportion of the crop will go into the silo. The hay crop is heavier than last year and of good quality. Corn, oats and barley are the forage crops raised, and the acreage is about the same as usual. Apples will be a short crop; pears, peaches and plums plenty. Feed in pastures is in fair condition, though beginning to get short. Rye is a good average crop; oats and barley below average, and some pieces rusting.

Russell (E. D. PARKS). — Potato bugs are doing some damage. Indian corn is in very good condition; not much will go into the silo. Hay was less than an average crop, but of good quality. Oats, Hungarian grass and millet are the principal forage crops grown. Market-garden crops are about average. Potatoes do not promise as well at present as commonly. The fruit crop is very poor in this locality. Pasturage is in average condition for the time of year. Rye, oats and barley promise well. Rain is needed for all crops; heavy showers have gone around us.

Southwick (L. A. FOWLER). — Cut worms and potato bugs are doing some damage. Indian corn made a rapid growth in the last month; only a few farmers have silos. The hay crop was larger than for several years. Hungarian grass and oats are the principal forage crops grown. Potatoes as a rule do not look very promising; few have been harvested, prices high. Apples and pears half crops; peaches reported good. Pasturage is in good condition.

West Springfield (N. T. SMITH). — Potato bugs have been unusually troublesome and nearly all fields are injured by them, some seriously; horn flies abundant. Corn has made phenomenal growth, but very little shows tassel as yet; one-tenth of the crop will go into the silo. Quantity of hay somewhat larger than last year, about 80 per cent of a full crop, quality below last year. Corn is the principal forage crop with some oats and peas, barley, Hungarian grass and Japanese millet. Market-garden crops are about average in yield and price; potatoes promise about a three-fourths crop. Apples practically none; pears a half crop; peaches 85 per cent; other fruits very light if any. The frequent showers have kept feed in pastures fresh and growing. Rye a full crop; oats rusted badly, straw short, mostly cut for hay; little barley grown and that light.

Wilbraham (H. M. BLISS). — Indian corn is a good crop, and most of it will go into the silo. Hay was almost a full crop of very good quality. Fodder corn is the principal forage crop grown to supplement the hay crop. Market-garden crops, including potatoes, promise, on the whole, about three-fourths crops; no potatoes dug as yet. Apples very light indeed; pears less than half a crop; peaches nearly a full crop; plums half a crop; quinces half a crop; grapes a three-fourths crop. Pasturage is in fair condition. Rye is a fair crop, oats rather light.

Monson (A. H. WHITE). — Potato bugs are very numerous. Corn is growing very fast; there are quite a few silos in town. Hay was an average crop both in quantity and quality. Potatoes are late and, I fear, a small crop. Fodder corn is the principal forage crop grown. A few apples and pears; some peaches and plums; quinces and grapes scarce. Pasturage is in nearly average condition. Rye, oats and barley are not up to the usual average.

Palmer (O. P. ALLEN). — Potato bugs are doing some damage. Indian corn is looking well, but is backward owing to the cold, wet spring; a limited amount will go into the silo. The hay crop was greater than usual in quantity and of very good quality. Corn is the principal forage crop grown. Market-garden crops promise well, and where harvested sustain yields and prices of former years.

The prospect for apples and pears is not good, for other fruits normal. Pastures are in very good condition. Rye, oats and barley are not up to the average.

Holland (FRANCIS WIGHT). — Potato bugs are doing some damage. Corn is doing well, but will be used for grain as we have not many silos in this locality. The hay crop will be a full average with other years in quantity and quality. Corn is the principal forage crop raised and rather more than usual will be grown. Potatoes are late and none have been harvested as yet. Apples will be light; pears and plums promise fair crops. Pastures are in good condition. Rye, oats and barley will be good average crops for grain, and are not much used for forage here.

WORCESTER COUNTY.

Oxford (D. M. HOWE). — Potato bugs are doing some damage. Indian corn looks nicely now and nine-tenths of the crop will go into the silo. Hay was a much larger crop than last year. Hungarian grass and barley are the principal forage crops grown and their acreage is about as usual. No potatoes harvested as yet but they look well. Apples a light crop, other fruits about as usual. Pasturage is in good condition. Some fields of oats are very small and backward, others look finely.

North Brookfield (J. H. CANE). — Potato bugs, squash bugs and squash vine borers are doing some damage. Corn is in fine condition; 20 per cent of the crop will go into the silo. Hay was 20 per cent above an average crop in quantity and of good quality. Corn, millet and Hungarian grass are the principal forage crops grown. Apples dropped very badly and there will be but few; pears one-fourth of a crop; plums dropped badly and will not be more than 20 per cent of a full crop; grapes in fine condition. Pasturage is in excellent condition for the time of year. Oats were badly injured by the hot, dry weather.

Rutland (L. S. DUDLEY). — Potato bugs and squash bugs are doing some damage. Corn is in good condition and about all the crop goes into the silo. Hay was a full average crop both in quantity and quality. Corn and Japanese millet are the principal forage crops grown and more has been put in than usual. Potatoes are looking well, but none have been dug as yet. Apples poor; pears good; other fruits not much raised. Pastures are in good condition. Rye, oats and barley were mostly cut green.

Oakham (JESSE ALLEN). — Potato bugs are doing some damage. Indian corn is in fine condition and perhaps one-fourth of the crop will go into the silo. Hay was about an average crop in

quantity and quality. Japanese millet and corn are the principal forage crops grown. Market-garden crops are in fair condition; potatoes will be a light crop. No apples, peaches or plums; few quinces; pears and grapes abundant. Pastures are in quite good condition. Rye and barley good crops; oats a small crop.

Dana (E. A. ALBEE). — Potatoes bugs, squash bugs and squash vine borers are doing some damage. Corn is nearly up to the normal; no silos in this town. The hay crop was about one-third above the average in quantity and of good quality. Corn and Hungarian grass are the principal forage crops grown and more than usual are being raised. There will be a good average crop of vegetables and potatoes are looking well. No apples, pears or peaches; plums and grapes average. Pastures are short and need rain. Rye an average crop; oats half a crop.

Petersham (S. B. COOK). — There are many potato bugs and squash bugs. Corn is a little backward but is growing rapidly; one-third of the crop will go into the silo. The hay crop was larger than for many years and of good quality. Fodder corn, oats and Hungarian grass for hay are our principal forage crops. Potatoes promise a fair crop of early planted with prices the same as usual; market-garden crops fair. Pears and grapes will be good crops; all other fruits, including apples, nearly a failure. Pasturage is in very good condition. Rye, oats and barley are about average crops.

Royalston (C. A. STIMSON). — Squash bugs and potato bugs are doing some damage. Indian corn is in good condition and about one-fourth of the crop will go into the silo. Quantity of the hay crop average, quality excellent. Corn, oats and barley are our principal forage crops, condition good, no more than usual raised. Potatoes are in poor condition, none as yet harvested. Pears and plums average; grapes fair; scarcely any other fruits. Pastures are getting short. Rye, oats and barley are about average crops.

Hubbardston (C. C. COLBY). — Potato bugs are unusually plenty and squash bugs have made that crop a failure. Corn is looking well and making a good growth; nearly all will be put into the silo. The hay crop was only about average in quantity but of excellent quality. An increased amount of forage crops is being raised, especially of Hungarian grass and Japanese millet. Potatoes are backward as well as all other root crops. The prospect is for a very light crop of fruit of all kinds. Pasturage is in excellent condition and is holding out well. Oats have made a poor growth and have rusted badly.

Fitchburg (JABEZ FISHER). — Insects are less troublesome than usual. Indian corn is making a luxuriant growth and will mostly

go into the silo. The hay crop was somewhat larger than last year but of no better quality. Apples will be a small crop; pears very good; peaches few; plums very good; and grapes very good. Pasturage is in very fair condition.

Harvard (J. S. PRESTON). — No particular trouble from insects. Corn looks well, but is about ten days late; but few silos in this town. There was a large crop of hay and that cut early will shrink a good deal, but the later cut is a good average quality. Hungarian grass and corn are raised for forage, are looking well and have about the usual acreage. Garden crops are very backward, peas especially were cut short by the drought, root crops are coming along fairly well. All fruits are a short crop this year. Pastures are in good condition. Rye, oats and barley are looking well, but are little raised for grain.

Shrewsbury (T. F. MARSTON). — Squash bugs are doing some damage. Indian corn is in fair condition and about a third of the crop will go into the silo. Hay is an average crop of good quality. Fodder corn is the principal forage crop raised, condition good, more raised than usual. Market-garden crops promise fairly well; yield of those harvested not up to the average; prices good. The prospect is good for a full fruit crop with the exception of apples. Pastures are in good condition. Oats have been very light. Potatoes look fairly well, but are very late, none having been dug.

Milford (J. J. NUTTER). — Squash and potato bugs are doing some damage. Indian corn is late, but looks quite promising; only a small proportion for the silo. There was a large quantity of hay, but the quality was rather poor. Corn is the principal forage crop raised. Apples will be a light crop; peaches, pears and grapes fair; good prospect for cranberries. Pasturage is in good condition. Rye, oats and barley are but little raised.

Blackstone (O. F. FULLER). — Potato bugs are doing some damage. Corn is a little backward; but one silo in town. There was more hay harvested this year than last. About the same amount of forage crops as usual are being raised this year. No early potatoes have been harvested; prices higher than last year. Very few apples and pears; a fair crop of peaches and plums; grapes a good crop. Pastures are holding out well. Oats have done poorly in this section; rye has done as well as usual; no barley raised for grain, but considerable raised for fodder.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON). — Indian corn is in good condition and growing fast, though a little late. Hay is more than an average crop in quantity and quality. Hungarian grass to be

hayed is the principal forage crop grown. Potatoes are not looking as well as usual. Not many apples; few pears; no peaches; grapes badly injured by rose bugs. Pasturage is in good condition. Rye good; oats light and rusted.

Sherborn (N. B. DOUGLAS). — Potato bugs are doing some damage. Corn is backward though coming on rapidly; one-third to one-half the crop will go into the silo. There was a large crop of hay of fair average quality. Corn, oats, barley and Hungarian grass are the forage crops grown and are raised in the usual amounts this year. Garden crops look well; no potatoes dug as yet. Apples and pears a light crop; peaches full crop; grapes average. Pasturage is in very good condition. Oats for forage a light crop.

Sudbury (E. W. GOODNOW). — Potato bugs and currant worms are our most troublesome insects. Indian corn is backward but is looking well; about one-fourth the crop will go into the silo. A large crop of hay of excellent quality will be harvested. Oats are used to supplement the hay crop and for the silo. All market-garden crops are backward with good prices for those harvested. There will be a very small crop of apples; prospect excellent for a large crop of peaches. All pastures are looking well. Most of the oats and barley raised are used for forage.

Ashby (A. WETHERBEE). — Potato beetles and tent caterpillars are doing some damage. Indian corn is late but otherwise will be a good crop; probably two-thirds of it will go into the silo. Quality of the hay crop good except that injured by wet weather at harvesting, quantity average. Japanese millet, oats, barley and fodder corn are the forage crops raised, look well and acreage larger than usual. Market-garden crops are not much raised, but have not made average yields. Nearly all fruits will give short crops, with the possible exception of grapes. Pastures are in need of rain. Oats poor; rye good; barley fair.

Dunstable (A. J. GILSON). — Potato bugs are our most troublesome insect. Corn never looked better, but was badly bent over by wind and rain on the night of the 18th; only a small amount goes into the silo. In quality the hay crop is good and in quantity a little above the normal. Corn, Hungarian grass and oats are the principal forage crops raised and are in good condition. No market-garden crops raised; no potatoes dug as yet. Apples, pears, peaches, plums and quinces very light crops; grapes and cranberries promise well. Pastures are getting short of feed. Rye, oats and barley compare well with former years.

Lowell (C. L. MARSHALL). — The pea vine louse is the only insect doing damage. Corn is in good condition and about three-

fourths of the crop will go into the silo. The hay crop is very good and has been well secured. Millet is the principal forage crop and is in good condition, with a great deal more raised than in former years. Market-garden crops already harvested show poorer yields and higher prices than usual; prospect for those to come good; potatoes late, not bottomed at all. Some apples and quinces; pears good; no peaches; plums good; grapes abundant. Pasturage is in excellent condition. Rye and oats are in very good condition.

Carlisle (E. J. CARR). — Potato bugs and squash bugs are doing some damage. Indian corn is backward but is growing fast; none put into the silo. The hay crop was the largest for many years and of the best quality. Corn and millet are the principal forage crops raised, and are looking well with the usual acreage. Potatoes looking well, none harvested; peas a poor crop and prices high. Small crops of apples, pears and peaches; plums, quinces, grapes and cranberries plenty. Pasturage is in the best of condition. Rye has done well, but oats and barley are very poor.

Woburn (W. H. BARTLETT). — Potato bugs, cut worms and currant worms are doing some damage. Sweet corn is raised for market and the stalks cut for fodder, very little Indian corn raised. Quantity of the hay crop above the average, quality very good. Rye, corn and millet are the forage crops raised; condition good and acreage as usual. The condition of market-garden crops is very good indeed; too early to predict as to potatoes. Apples poor, also pears and peaches; plums and quinces fair; grapes good. Pasturage is very good indeed. Rye, oats and barley are about average crops.

Winchester (MARSHALL SYMMES). — Potato bugs and cut worms are doing damage, while the gypsy moth is appearing in places and eating clean as it goes. There was a very heavy crop of hay of good quality. Forage crops, as such, are not much raised, as sweet corn stalks, pea vines, etc., are abundant. Market-garden crops are growing well; potatoes not ripe yet. Light crop of apples; good crop of pears and plums; peaches promised a good crop, but have recently turned gummy and spotted and dropped badly. Pasturage is in first-rate condition. Rye very heavy and good.

Newton (OTIS PETTEE). — Potato bugs are most troublesome, and cut worms are doing a little damage. Indian corn is looking finely, with the promise of a good crop; about the usual acreage for the silo. Hay was a good crop, and is nearly all housed; quality not quite up to the standard. Corn and oats are the principal forage crops grown, and are raised mainly for summer feed-

ing. Early potatoes are rather below an average crop; late ones doing finely. Pasturage is in very good condition. There is but little rye grown this season, but what there is has done well.

ESSEX COUNTY.

Salisbury (WESLEY PETTENGILL). — Potato bugs are doing the most damage at the present time. Corn is looking well as the hot weather has pushed it along rapidly, but very little will be put into the silo. The hay crop was good, larger than last year, but not a great crop. Fodder corn, millet and barley are the principal forage crops grown, and are looking finely, with an increased acreage. Market-garden crops are in good condition; potatoes looking fairly well; prices above the average. Apples are a light crop; pears good; peaches rather light; plums and grapes good. Pastures are in good condition. Rye, oats and barley are rather less than average crops. Beans are looking finely, but squash vines are dying badly.

Haverhill (EBEN WEBSTER). — Potato bugs, squash bugs and canker worms are doing some damage. Indian corn is in good condition, and about two-thirds of the crop will go into the silo. The hay crop is about the same as two years ago as to quantity and of good quality. Potatoes look well. Market-garden crops about as usual. Apples light crop; pears plenty; plums short. Pasturage is in very fair condition. Rye, oats and barley are good crops for forage.

Newbury (G. W. ADAMS). — Potato bugs are doing some damage. Indian corn promises a fair crop, one-third of which will go into the silo. Hay was three-fourths of a full crop of fair quality. Fodder corn and oats are the principal forage crops grown, and are about average in condition. Market-garden crops, including potatoes, are late, and recently badly pinched by drought. Apples poor; pears fair; no peaches; plums poor; quinces very few; grapes fair; cranberries small crop. Pasturage is dried up. Rye, oats and barley are nearly average crops.

North Andover (PETER HOLT). — Corn is small for the time of year, but is growing very fast now; nearly all that raised goes into the silo. The hay crop was larger than for the past two years, but much of it is being injured by bad weather. Indian corn is the main fodder crop. No potatoes harvested as yet. No winter apples, a few early apples of poor quality; no peaches or plums; grapes look well. Pasturage has been extra good. The late, wet spring brings hoeing and haying together.

Ipswich (O. C. SMITH). — Potato bugs are the most in evidence

of any insect. Corn started late, but is now growing finely and promises a good crop; about 30 per cent of which will go into the silo. The hay crop was above the average in quantity and of good quality. Corn and Hungarian grass, with some oats, are the forage crops grown, and are all growing well with acreage as usual. Early potatoes a light yield, other market-garden crops good, prices higher than usual. Apples a small crop; pears fair; quinces and grapes below the average; cranberries promise a fair crop. The rains have kept pastures fresh and growing. Rye, oats and barley about normal crops.

Manchester (JOHN BAKER). — Potato bugs are doing some damage. Indian corn is in good condition; no silos in town. Hay was first-class crop. Oats and Hungarian grass are the principal forage crops grown, condition good and acreage about as usual. Market-garden crops, including potatoes, promise well, with prices about as usual. Apples a small crop; no peaches; plums a good crop, also grapes. Pasturage is in good condition. Rye, oats and barley are raised as forage crops and are in good condition.

NORFOLK COUNTY.

Randolph (R. A. THAYER). — Potato bugs and squash bugs are doing some damage. Indian corn is looking finely and is growing rapidly. The hay crop was about a fourth larger than for the last two seasons. Millet, oats and barley are the principal forage crops raised and the acreage is about the same as usual. Market-garden crops are in fine condition, yield and prices good; potatoes very late. Apples will be a small crop; other fruits fair crops or better. Pasturage is in very good condition. Rye, oats and barley are very good crops.

Avon (S. F. Oliver). — Potato bugs are our most troublesome insect, but even they are well cared for. Very little corn is planted for ensilage. The hay crop was heavy, but late rains have injured it in course of making. Sweet corn, mangels and sugar beets are the principal forage crops grown and all look well. Peas and beans yielded well and potatoes look well. Apples and pears are not very abundant, but seem of pretty good quality. Pastures are in good condition.

Stoughton (C. F. CURTIS). — Potato bugs are doing some damage. Corn is in very good condition and 90 per cent of the crop will go into the silo. Hay was more than an average crop and the quality of the early cut was perfect, but that cut later has been considerably damaged by rain. Peas and oats, Japanese millet and common millet are the principal forage crops grown, condition varies

according to the land, some being too wet and some too dry. Potatoes are not quite ready for harvesting ; peas doing well. The prospect is very good for all fruits. Pasturage is in extra good condition from timely rains. Rye, oats and barley are fully up to the average.

Medway (MONROE MORSE).— Potato bugs and squash bugs are doing some damage. Indian corn is late but is growing well now ; one-third the crop will go into the silo. Hay was an extra crop in quantity and of good quality. Corn and oats are the principal forage crops grown. Potatoes promise a three-fourths crop. Apples very poor ; pears fair ; peaches good ; plums rotting ; grapes good.

Norfolk (G. E. HOLBROOK).— Potato bugs are doing some damage. Corn is very backward, but is of good color. Hay was just an average crop. Corn and Hungarian grass are the principal forage crops grown and are looking well. Potatoes are almost a failure. The apple crop is the poorest for years ; pears, peaches and grapes look well. Pastures are in good condition. Rye is a good crop ; oats and barley cut for feed and look well.

Foxborough (E. A. MORSE).— Potato bugs and elm leaf beetles are doing some damage. Corn is looking finely, was backward at first but is booming now ; only two silos in town. The hay crop is above the average. Corn, Hungarian grass and barnyard millet are the principal forage crops grown. Potatoes are looking well, but none are harvested as yet. Apples a fair crop ; pears and plums a full crop ; cranberries promise well, and should be a full crop. Pasturage is good for the time of year as we have had plenty of rain.

BRISTOL COUNTY.

Mansfield (Wm. C. WINTER).— Potato bugs, thrips on grape vines and rose bushes, and currellos on plums, apples and pears are doing some damage. Corn is in excellent condition, but late ; no silos in this town. Quantity of the hay crop above the average, quality generally excellent. Sweet corn and oats are the principal forage crops grown and the acreage is about the same as usual. Market-garden crops are all looking well now. Apples and pears promise one-third crops ; no peaches ; plums and grapes looking finely ; quinces half a crop. Pasturage is in excellent condition. Rye, oats and barley are more than average crops both for grain and forage.

Norton (Wm. A. LANE).— Potato bugs are doing some damage. Indian corn is in good condition ; no silos here. Hay was a good crop in both quantity and quality. Fodder corn, millet and Hun-

garian grass are the principal forage crops grown. Potatoes are in poor condition and promise only a small crop. Pastures are in fair condition. Rye is a good crop; oats a failure this year, owing to blight and rust.

Raynham (N. W. SHAW). — Potato bugs are doing some damage. Indian corn looks well, but none is raised for the silo. The hay crop was larger than usual and of average quality. Hungarian grass and fodder corn are our principal forage crops with the acreage about as usual. All garden crops are backward; potatoes promise a good crop. Apples will be a small crop; pears a full crop; no peaches; plums falling off; grapes average. Pastures in good condition.

Berkley (R. H. BABBITT). — Elm tree beetles, potato and squash bugs are doing some damage. Corn is very backward but is growing finely; very little will go into the silo. The hay crop is below the average in quantity but of good quality. Peas and oats, fodder corn and millet are the principal forage crops grown. Early potatoes are a failure; other market-garden crops fair. Strawberries were a failure. Few apples; pears plenty; peaches light; plums, quinces and grapes average. Pasturage is in very good condition. Rye, oats and barley are much below average crops.

Seekonk (F. A. HOWE). — Indian corn is looking well; very few silos in town. The hay crop is double that of last year. Millet and barley are our principal forage crops and are looking well, with about the usual acreage. Market-garden crops are all looking well; very few potatoes harvested yet. Very few apples; prospect good for pears; other fruits a failure. Pasturage is in good condition. Rye, oats and barley are very good crops.

Westport (A. S. SHERMAN). — Canker worms, potato beetles and currant worms are doing some damage. Corn is looking well but late; none put into the silo. The hay crop was good but the quality was injured by showers. Corn and oats are cut green and cured for fodder. Potatoes are late and none harvested as yet. Apples a slim crop; pears plenty; peaches more than usual; no plums; quinces scarce; grapes abundant. Pastures are in very good condition. Oats have done well.

PLYMOUTH COUNTY.

Brockton (DAVIS COPELAND). — Black squash bugs and potato bugs are doing some damage. Corn is looking well but is late; three-fourths of the crop will go into the silo. The hay crop was good both in quantity and quality. Ensilage corn is about the only forage crop raised. Market-garden crops are hardly average

in yield, prices low. Grapes are looking well but other fruits are below the average. Pasturage is in good condition. Oats and barley are not much raised in this locality; rye a good crop.

Marshfield (J. H. BOURNE). — Potato bugs, squash bugs, canker worms and elm leaf beetles are doing some damage. Indian corn is in excellent condition and was never growing faster; one-third the crop will go into the silo. The hay crop was 20 per cent heavier than last year and of first-rate quality. Soy beans and Japanese millet are the principal forage crops grown, with some oats and barley. Late potatoes are two weeks later than usual and were much benefited by the recent rains. Pears, peaches and grapes abundant; no apples; cranberries give promise of a large crop. Pasturage is in just the right condition and will hold out well. Rye, oats and barley are average crops.

Plympton (WINTHROP FILLEBROWN). — Potato bugs, squash bugs and cut worms are doing some damage. Corn was in excellent condition, but was badly blown down by a recent shower. The hay crop was much in excess of several years previous. Corn fodder is being raised in about the usual amount. All garden crops have done exceptionally well, except Hubbard squashes. Apples, pears, peaches and quinces are not up to the usual condition; plums, grapes and cranberries are looking very promising. Pasturage holds out exceptionally well on account of frequent showers.

Bridgewater (R. CASS). — Potato bugs, squash bugs and squash vine borers are doing some damage. Indian corn is growing rapidly and is in good condition; none will go into the silo. The hay crop is not up to expectations in quantity, but of good quality. Japanese millet, fodder corn and buckwheat are the principal forage crops, and are in good condition though late, with about the usual acreage. Late market-garden crops are in good condition, and potatoes are coming on rapidly. Early apples fair, late varieties poor; pears and quinces good. Pasturage is above the normal for this time of year. Rye was an average crop; oats very light.

Lakeville (N. G. STAPLES). — Potato bugs are the only insects doing damage. Indian corn is in good condition; only a very small proportion will go into the silo. The hay crop was large, but has suffered in the making. Corn, Hungarian grass and Japanese millet are the principal forage crops grown, and are in excellent condition, with about the usual acreage. Early potatoes a light crop; garden crops look well. Few apples; pears and grapes very plenty. Pastures are in about average condition. Rye, oats and barley are about average crops.

Mattapoisett (E. C. Stetson). — Squash bugs and potato bugs are

doing some damage. Corn is late, but is growing very fast now; no silos in this section. The hay crop is better than for a number of years. Oats and fodder corn are the principal forage crops; oats rather poor in condition, corn quite good; about the usual acreage of both. Potatoes are late, but are looking quite well; peas a good crop and brought good prices. Apples poor; pears good; quinces and grapes quite good. Pastures are in very good condition. Rye good; oats rather poor; no barley raised.

BARNSTABLE COUNTY.

Falmouth (D. R. WICKS). — Potato bugs are doing some damage. Corn is late, but of good color and growing fast; only one or two farmers have silos. Hay was a full crop as to quantity, but the quality was poor owing to bad weather at time of cutting. Market-garden crops fair; too early to judge as to potatoes. Corn is the principal forage crop raised with some oats. No apples; pears plenty; peaches about a failure; plums also; quinces about half a crop; grapes plenty; cranberries normal crop. Pastures are in fine condition and there will be plenty of late feed. Rye is a fair crop, but oats have rusted.

Mashpee (W. F. HAMMOND). — The potato bug is doing some damage. Indian corn is looking very well, but none will be put into the silo. Quantity and quality of the hay crop above the average and it was secured in good condition. Corn, rye and oats are the forage crops grown and the acreage is less than usual. Market-garden crops are above the average in quality, quantity and price. Apples, pears and peaches are all a failure; grapes and cranberries one-third crops. Pasturage is in very good condition. Rye and oats are less than average crops.

Barnstable (JOHN BURSLEY). — Cranberry insects are doing a limited amount of damage and orchards not sprayed are looking poorly. Indian corn is a little late, but is growing very fast at present; none raised for the silo. The hay crop was a third larger than in 1900, but smaller than in 1898. Corn and Hungarian grass are the principal forage crops grown and are in fair condition. Market-garden crops are two weeks later than usual. Apples and pears light crops; grapes good; cranberries blooming heavily. Pastures are in good condition. Rye 25 per cent above an average crop; oats a one-third crop; very little barley grown.

Harwich (A. N. DOANE). — Potato bugs and squash bugs are doing some damage. Corn is in fair condition; only one silo in town. The hay crop was very good in quantity, but not in quality. Yield and price of market-garden crops about the same

as usual. Very few apples or peaches ; quinces, grapes and cranberries fair crops. Pastures are in much better condition than last year. Rye, oats and barley are good crops.

Eastham (J. A. CLARK).—There is very little trouble from insects. Indian corn is not much grown, but what there is looks finely ; no silos. Hay was fully an average crop in both quality and quantity. Oats are our principal forage crop. Market-garden crops look well and potatoes look finely. Apples scarce ; some pears ; grapes plenty ; no peaches. Pastures need rain. Asparagus was a rather small crop, but the prices were the best for years.

Truro (D. E. PAINE).—Potato bugs are doing some damage. Indian corn is very little raised. Hay was more than an average crop in quantity and of good quality. All garden crops are very late. Apples will be a fair crop. Pasturage is in good condition.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE).—Squash bugs and potato beetles are doing some damage. Corn is in good condition ; we have no silos. The hay crop was above the average in quantity and of good quality. Potatoes are late with us and other market-garden crops are in need of rain. Pasturage is in very good condition. Oats are much better than an average crop.

BULLETIN OF
MASSACHUSETTS BOARD OF AGRICULTURE.

SELECTION AND IMPROVEMENT OF THE DAIRY
HERD.

By Prof. F. S. COOLEY, *Professor of Animal Husbandry and Dairying, Massachusetts Agricultural College.*

That the cows of Massachusetts are producing as much as the standard of good husbandry calls for, no well-informed agriculturist would be optimistic enough to assert. A glance at a few facts in regard to milk and butter production will be suggestive to any one interested in the matter. According to Maj. Henry E. Alvord, chief of the dairy division of the United States Department of Agriculture, the average cow gives about 3,000 pounds of milk, yielding 125 to 130 pounds of butter per annum. Dr. J. B. Lindsey's estimate, after a canvass of representative creamery districts, of 150 pounds of butter per cow per annum, is very near to Alvord's figures for Massachusetts. In my own canvass during the summer of 1899 of all the creameries in the State, 175 pounds of butter per cow was found to be the average annual yield. This would indicate the milk flow to be about 1,700 quarts, worth \$42.50, at $2\frac{1}{2}$ cents a quart. One hundred and seventy-five pounds of butter at 22 cents per pound would amount to \$38.50, and adding the price of 1,500 quarts of skim-milk, worth $\frac{1}{3}$ cent per quart, we would have \$43.50 as the value of the butter and skim-milk. It is doubtful whether \$43.50 will pay for a year's keep of a cow at average prices. Certain is it that such a sum cannot leave a very wide margin of profit.

Cows are to be found that are better than the average,—producing 400 to 500 pounds of butter and 8,000 to 12,000 pounds of milk in a year. At the foregoing price for milk such cows return \$100 to \$150 per year for feed consumed. The extra feed con-

sumed will hardly be in proportion to the gain in product, so that with increased capacity comes greater profit. The greater profit almost invariably accompanies the higher rate of production.

By these comparisons between average and extra cows is brought out the apparent advantage of keeping the latter, and yet the difference in value between them is generally very much under-estimated. Consider for a moment the average cow, making an annual product of 1,700 quarts of milk, worth \$42.50, the cost for her keeping being \$40. Another cow consumes \$50 worth of feed and produces 2,500 quarts of milk, worth \$62.50. A still better cow, at a cost of \$65 for maintenance, produces 4,000 quarts of milk, worth \$100. Two dollars and fifty cents, \$12.50 and \$35 represent the respective profits earned by these cows. If we assume the value of the cow in each case to be her beef value (say \$30) plus the additional sum upon which she will pay $8\frac{1}{2}$ per cent interest, taxes and insurance, and 25 per cent depreciation, then cow No. 1 is worth \$37.50, No. 2 is worth \$67.50 and No. 3 is worth \$135. These values are real, provided the useful period of the cow in question is four years. If the period is longer or shorter than that, a proportionally greater or less value would obtain. If the useful period of a cow is three years, the depreciation factor should be $33\frac{1}{3}$ per cent, or if it is five years 20 per cent. While these values are in no sense fictitious, they are not commensurate with the market prices. The \$37.50 cow will probably cost \$40, and allow her purchaser to lose \$2.50 on the trade. The \$67.50 cow will cost from \$50 to \$55, and leave a fair margin for the risk taken. The \$135 cow will cost possibly \$70 to \$80, and prove the best bargain of the three.

Carrying out these comparisons for herds of 20 cows of each grade, each herd to be bought at the foregoing prices, kept for four years and then sold for beef at \$30 each, we have the following:—

DR.	
No. 1. To 20 cows at \$40 each,	\$800
To keeping four years at \$40 per cow per annum,	3,200
To interest, taxes and insurance on purchase at 8 per cent,	256
	—————
	\$4,256
CR.	
By 136,000 quarts of milk at $2\frac{1}{2}$ cents,	\$3,400
By 20 beefs at \$30,	600
By loss,	256
	—————
	\$4,256

DR.

No. 2. To 20 cows at \$52.50,	\$1,050
To keeping four years at \$50,	4,000
To interest, taxes and insurance on purchase at 8 per cent,	336
To profit,	214
	<hr/>
	\$5,600

CR.

By 200,000 quarts milk at 2½ cents,	\$5,000
By 20 beeves at \$30,	600
	<hr/>
	\$5,600

DR.

No. 3. To 20 cows at \$75,	\$1,500
To keeping four years at \$65,	5,200
To interest, taxes and insurance at 8 per cent,	480
To profit,	1,420
	<hr/>
	\$8,600

CR.

By 320,000 quarts milk at 2½ cents,	\$8,000
By 20 beeves at \$30,	600
	<hr/>
	\$8,600

These balances ignore entirely credits for calves dropped, which would be much greater with the best cows. It becomes apparent that the advantage is decidedly with the \$75 cows, so that good husbandry demands that earnest effort be put forth to secure the best for milking purposes.

My own herd, all of which has been bought, as occasion offered, at an average cost of \$43.50 per head, and kept for about \$65 per head per year, has produced an average annual yield of 7,576 pounds of milk. These cows are at a disadvantage where milk alone is considered, as their milk is rich in fat, giving a relatively high butter product. A fairer basis for comparison is the pounds of butter fat obtained. Quarts of milk are taken in this discussion merely for simplicity of expression.

I am acquainted with large herds producing from 300 to 400 pounds of butter per cow, and averaging from 6,000 to 8,000 quarts of milk. No progressive dairyman ought to be satisfied with less than 400 pounds of butter as the average annual product of his herd, nor keep a cow not capable of yielding at least 300 pounds. "Cow-boarders" should be disposed of without hesitation for what they will bring.

HOW TO KNOW A GOOD COW.

Judges of dairy stock differ more or less in their methods of selection, and the relative importance they attach to the points presented. There is a general similarity of observation and opinion; but I am aware that in attempting to describe those points which I consider most essential I shall lay myself open to criticism by other and perhaps better judges of milk and butter cows. Perhaps such criticism would be helpful rather than otherwise.

The essential points in the conformation of a dairy cow are briefly, and about in the order given:—

1. Udder capacious, with broad attachment.
2. Body large and deep.
3. Hind quarters wide and strong.
4. Fore quarters spare fleshed and rather openly jointed.
5. Milk-veins, skin, hair, temperament, etc., indicating large milking powers.

To enlarge on these points in detail:—

1. *The Udder.*—Capacity is the chief requirement in a good udder, but it is not always indicated by the size and shape of the organ. An udder may be large and yet meaty and not capacious; or it may be unsymmetrical and yet elaborate a large quantity of milk. It must be long and broad in its attachment to the body, becoming more let down with advancing age, but not pendulous. If it extends well up behind and well forward, and has great width, its capacity is assured, regardless of its vertical dimension. As a fancy point teats squarely placed and wide apart are desirable, but this does not always assure large milking powers or a lack of it the reverse. The placement of the teats is indicative of milk yield, but not infallible. Even symmetry of the quarters may not be a guarantee of good milking powers, although a tipped up udder mars the beauty of the cow. Avoid an udder that begins too low down in the twist and extends only moderately well forward, even if it is large and pendulous. Size and shape of teats are matters of convenience in milking. It must be borne in mind, however, that anything that saves labor is a great advantage on the farm as well as elsewhere, and a hard, slow-milking cow, requiring five or ten minutes more than the average time for milking daily, means an extra expenditure of from \$4 to \$8 per year for attendance. She ought to be discounted from \$10 to \$15 in price on this account.

2. *Size of Barrel.*—A long, deep, capacious body is one of the essentials of milking power often lost sight of, yet nevertheless of

prime importance. Often we hear that the cow is "a hard-worked animal," and it is true that a large expenditure of energy is involved in the conversion of the coarse forage on which she subsists into milk. This elaboration is most economically carried on in a large and perfectly organized laboratory. A wasp-waisted cow rarely proves particularly profitable in the dairy. Much more stress ought to be laid on the length and depth of the barrel than is now the case, whether one is selecting breeding stock or merely purchasing milkers for present needs.

3. *Hind Quarters.* — That milk production is closely associated with the maternal function is not to be disputed. The conformation generally conceded to be most desirable for breeding is, therefore, to be also sought in a dairy cow. Wide, rather prominent hips and a roomy pelvis are considered important. The rump should be long and level, and notwithstanding the fact that many good cows have had sloping and peaked rumps, such a conformation mars the beauty of a cow, reduces her value in the market and adds nothing to her dairy capacity. Good depth of quarters is also desirable, and at least moderate straightness on their back and sides. Extremely cat-hammed animals are not so much prized as formerly. The milch cow differs from her beef cousin in having an open twist, with her udder filling the place where meat ought to be in the latter.

4. *Light Fore End.* — This is relative rather than absolute and may be overdone. The head is longer than in the beef type; the neck longer and not so well filled in the neck vein. The shoulders are not so wide and are more prominent at the withers. The crops are slacker, and the anterior vertebrae more prominent. The articulation of the bones is looser, with longer spinus processes. The ribs are not so well sprung, giving a fish-backed rather than a hooped effect. The general conformation is lighter, longer and less compact than in beef stock, yet this lightness must not be extreme, as anything that produces delicacy and lack of constitutional vigor detracts from the usefulness of the animal. There must be, therefore, no crowding of the vital organs, but reasonably large lung capacity should be sought, measured by good heart girth.

5. *Superficial Points.* — According to age, large milk veins are indicative of large milk secretion. Good size or double extension of the vein is desirable. Length secured either by tortuous, convoluted shape, or by extending far forward, as well as numerous prominent branches on belly and udder, add to the value of the animal. The "milk wells," or orifices through which the milk veins enter the abdominal cavity, must be large or numerous. The real significance of milk veins is found in their function in the

circulatory system of the udder. An udder well supplied with blood vessels is more highly organized than one not so well provided. Blood is the source of milk, and its abundance in the udder is indicated by the extent of the circulatory system, of which the milk veins are the sensible portion.

The skin ought to be mellow and not too thick, its mellowness again being an indication of a good circulatory system so essential to milk secretion.

The hair ought to be fine and close lying, according to breed. Long, mossy hair is the mark of beef stock.

The escutcheon is a point of minor importance. While some dairymen lay much stress on a good escutcheon, and, while coupled with other indications of excellence, it is useful, without this accompaniment of other dairy points it loses its significance and importance. Many of our best authorities now pay very little attention to the escutcheon. There is often danger of letting some hobby of minor consideration obscure the real essentials in judging.

The yellow pigment on the skin is indicative of the richness of the product rather than its amount, hence its main use is to show the kind of milk given.

Temperament is something carefully observed by some cattle experts, but it is rather intangible to the uninitiated. The dairy temperament is nervous rather than lymphatic. It should give the effect of suppressed rather than active nervousness.

HOW TO SECURE GOOD COWS.

Whether one acquires his dairy stock chiefly by breeding or by purchase, the latter method must be depended upon more or less, and a knowledge of the foregoing dairy points is a useful aid in making selections. Purchase of stock is attended with many disadvantages that do not hold in breeding. There is an uncertainty of the capacity of purchased cows. Select as carefully as we will, we shall often be disappointed in the product of the cows we buy. There is often also a great shrinkage in the yield of milk from cows of known excellence when subjected to different conditions of food and management. Defects are often found in purchased cows that could easily account for their sale. Cows with weak quarters, and hard or defective milkers are very common among sale stock. Unpleasant habits such as kicking, fence-breaking, self-sucking, etc., may be found among one's purchases. There is the further possibility of introducing disease into the herd by purchase. Perhaps the most common disorders thus transferred are abortion and tuberculosis.

One is not entirely free from such troubles in rearing his own

cows, but he will greatly diminish the chances of introducing them and prevent them to a large extent. He will be able to get a better class of cows by breeding, avoid uncertainties and pass inferior animals on to the butcher.

. The cow is not a "machine," with regularly listed speed and capacity, but is vastly more susceptible to external conditions than most machinery. Her capacity depends not only on her own inherent power of work, but also on a hundred other things, — food, water, regularity of attendance, heat, flies, bed, exposure, worry, etc. This is not all. The same cows, with as nearly the same treatment as possible, on the same farm, will vary greatly from one year to another. One cow is biennial, like an apple tree, — giving a large product every other year, alternating with a year of rest and recuperation, in which she does not pay her keep. Another falls off without any apparent reason. There are also the exigencies of retained afterbirth, milk fever, garget or accident, which put the very best cows temporarily or permanently on the list of boarders. Perhaps it is not too much to say that a cow rarely does particularly well after a year in which she has made a phenomenal product.

BREEDING FOR IMPROVEMENT.

In grading up a herd one must first decide upon the kind of cattle that most nearly meet his requirements. No discussion of breeds is here intended. Jerseys, Holstein-Friesians, Guernseys, Ayrshires, Shorthorns, Dutch Belted, Devons, Red Polls, Brown-Swiss, etc., all have their strong points, and each is adapted to its own peculiar place better than any of the others. Do not try to keep Shorthorns where Ayrshires are more appropriate, nor Holstein-Friesians where Devons would do better. Selection must be made with reference to the qualities wanted and should be permanent. I have no patience with the continual change from one breed to another, which so often results in a heterogeneous collection of misfits of indefinite characters. Choose the breed best adapted to your requirements, and then select with equal care the individuals that go to make up your herd. The individual within a breed is of greater importance than the breed itself. There are many scrub pure-breds, no better than common scrubs, but more dangerous because of conjuring with pedigree. Pedigree is valuable as a reason for excellence, but not as an excuse for mediocrity.

Then there are different characters within a breed, and one must not only select the general type but the particular qualities wanted. Do not try to breed butter fat into Holstein milk by a Jersey cross, but rather select Holsteins of a family known to be richer than the

general run. Do not cross rich Jerseys deficient in quantity with another breed hoping to remedy the defect, but find a Jersey strong in quantity for the purpose. Remember in selecting that it is the individual as well as the breed that determines the characters likely to be transmitted, and seek diligently within the breed for those qualities needed for the purpose in view.

The Bull.

The old saying, "The bull is half the herd," is not the whole truth. He is, or else he isn't, according to the strength with which he transmits the qualities he possesses. I sometimes find a scrub bull which is not half the herd because the cows with which he is mated have the stronger inheritance and transmit their qualities with greater intensity than he. On the other hand, as a power for degeneration he is often more than half. In improvement it has been said that the cows should be depended on to maintain the standard of excellence reached, but any raising of that standard must come through the bull. Among grade cows a pure-bred sire ought to exert by far the greater influence over the qualities of the progeny. For these reasons much greater care ought to be bestowed in the selection of the male breeding animal. It would be better in most cases to select the bull less frequently and be more particular about his quality. The practice of buying a calf or a yearling and selling him after a few months' service has worked much injury to our breeding interests. By selecting more carefully, and after excellence is proved, keeping as long as possible, one-half the bulls might be dispensed with and the remainder maintain a much higher standard of quality.

Many bulls are destroyed before their qualities are known. If good, there is no chance to duplicate their good work. If bad, the mischief has already been done. The difference in value between good and poor bulls is much wider than is commonly believed. Even in getting bob or veal calves there may easily be a difference of from 50 cents to \$2 per head in what they are worth, amounting to from \$20 to \$100 in a year's service. If, however, a bull is destined to be the sire of heifers to replenish the herd, those from a good bull are worth at maturity from \$10 to \$25 per head more than those from a scrub. In four years' service this may amount to from \$400 to \$1,000, even in a grade herd, and easily warrant an outlay of from \$200 to \$500 for a young sire of superior merit. Very well-bred and promising young bulls may be bought at from \$50 to \$100 apiece, and it is poor husbandry to pass such chances by to purchase scrub stock.

An acquaintance told me a short time ago that he was done

buying cheap bulls. He had had abortion, impotency and other troubles enough. He had just paid \$23 for a really good service bull. It reminded me of the colored man who bought a horse for 75 cents, which died on the way home. He remarked, "I'll hab a good hors nex' time if it costs foalh dollars." It is not good hnsbandry to support a low-grade bull. It will pay even an ordinary grade breeder to keep an animal worth \$100.

Some attention must be paid in selection to correcting the defects of the other sex. Pedigree should count, but individual merit counts more. The value of pedigree depends mainly upon the character of the immediate ancestors. Excellence in remote ancestors, interesting and desirable though it is, must not be allowed to cover up deficiencies in parents or grandparents. Much conjuring is done with the names of great ancestors which would doubtless be ashamed to own some of the descendants now claiming their ancestry. There is also a prepotency in some individuals that clothes them with unusual power to stamp their qualities on their get. This is partly the effect of pure breeding, but it is only an occasional sire that manifests it strongly. When such a sire is found he should be duly prized and retained in service as long as possible.

Rearing and Developing Heifers.

Some attention may well be paid to the selection of heifer calves. Those of very small size, or weak, or serionsly defective have no place in the young herd. We are accnustomed to have much regard to the parentage and we do well; but no less attention is due to the young heifer itself. The next consideration is the growth of the calf. At no period can growth be more economically secured than during calfhood. Only choice registered calves are reared on whole milk in this State, and it is doubtful if it will pay to use whole milk for common stock where a cheaper substitute is available. A set-back during the first few weeks is hard to overcome afterwards. Feeding a little whole milk in the ration during the first month is one of the best ways of insuring against setbacks.

My practice of rearing calves has been to separate the calf from its dam after the first full meal. It is taught to drink and feed on its mother's milk for a week, in moderate feeds twice a day. Warm separator milk is gradually substituted during the second week, until it forms almost the entire feed. About a quart of new milk per day is fed till the end of the first month. Two feeds daily are given, always warm and never excessive in amount; but three feeds per day would be better. Calves are taught to eat dry grain after two weeks old and given *ad libitum* a mixture of corn meal, oil meal, bran and ground oats in about equal parts.

Coarse forage — hay, silage or grass — is always supplied to the extent of the calf's appetite.

The horns are removed by the use of caustic potash during the first two weeks, thus securing the benefits of dehorned cows without disfigurement or trouble.

While calves grow faster in almost complete confinement, a hardier and more rugged cow results where they have daily exercise in yard or pasture. The feed of skim milk is continued during most of the first year if the supply does not fall short. At all events, growth must be kept rapid by liberal feeding, until the heifers are sent off to pasture. Here, again, it is poor economy to keep stuff on short feed. A stunted growth is a great loss to the breeder. During the second winter heifers receive a small feed of the grain mixture given to the milking stock, consisting of gluten feed, and cottonseed or other concentrate, corn meal and bran. The main thing is to keep growth active. Size in a dairy cow adds much to her value, either in the dairy or sale ring.

Breeding should not take place until after the heifer is eighteen months old. Some of the best cows I have seen were allowed to reach two years old before being bred. It is significant that some beef breeders do not receive for registry as pure-bred calves from pure-bred parents where the dam is under twenty-seven months old at the time of calving. Breeding too young detracts much from the usefulness of heifers. The season of the year for breeding is purely a matter of convenience, and need not be considered in this paper. The interval between successive calves is commonly one year, but it is noticeable that cows do very much better after a longer interval. This is especially true in young cows. If an interval of fifteen to eighteen months is allowed between first and second calves the cow makes a considerable growth that enhances her value and increases her capacity for milk.

Young cows require to be liberally fed. It must be borne in mind that the two-year-old cow has not only to yield milk but also complete her growth. If concentrates are withheld at this time, on the mistaken notion that they are injurious to young cows, not only is her milk flow lessened, but she is hindered from reaching her most useful development. It may not be desirable to crowd young heifers with heavy feed, but when they milk deeply there must be the material to supply the drain just as well as in mature cows.

MASSACHUSETTS

CROP REPORT

FOR THE

MONTH OF AUGUST, 1901.

ISSUED BY

J. W. STOCKWELL,
SECRETARY STATE BOARD OF AGRICULTURE.

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CROP REPORT FOR THE MONTH OF AUGUST, 1901.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Sept. 3, 1901.

Bulletin No. 4, Crop Report for the month of August, is herewith presented. Particular attention is called to the article on "Poultry keeping as a principal feature of diversified farming," by John H. Robinson, editor of "Farm Poultry."

PROGRESS OF THE SEASON.

The August returns of the United States Department of Agriculture (Crop Reporter for August, 1901) state that the average condition of corn declined 27.3 points during July, and on August 1 was 54, being 33.5 points lower than last year, 35.9 points lower than in 1899, and 33.6 points below the mean of the August averages for the last ten years.

The average condition of spring wheat declined 15.3 points during July, being 80.3 on August 1, which was 23.9 points higher than on the corresponding date last year, and but 3.3 points lower than on Aug. 1, 1899, and 1.2 points below the mean of the August averages of the last ten years.

The average condition of oats was 73.6, a decline of 10.1 points during July, and 11.4 points lower than on the corresponding date of last year, 17.2 points lower than in 1899, and 10.2 points below the mean of the August averages for the last ten years.

The average condition of barley declined 4.4 points during July, being 86.9, which, however, was 15.3 points higher than a year ago, but 6.7 points lower than in 1899, and 2.8 points above the mean of the August averages of the last ten years.

The average condition of spring rye declined 9.7 points during July, and was 83.6 on August 1, which was 7.6 points higher than on the corresponding date last year, 5.4 points lower than on Aug. 1, 1899, and 2.2 points below the mean of the August averages of the last ten years.

Preliminary returns indicate an increase of 43,000 acres, or 6.7 per cent, in the acreage of buckwheat, as compared with last year. The condition was 91.1, being 3.2 points higher than last year, 2.1 points lower than in 1899, and .5 point above the mean of the August averages of the last ten years.

The average condition of potatoes declined 25.1 points during July, to 62.3, which is 25.9 points lower than on the corresponding date last year, 30.7 lower than on Aug. 1, 1899, and 24.8 points below the mean of the August averages of the last ten years.

Of the thirteen principal sweet-potato-producing States, only two report an improvement during July.

Preliminary returns indicate a reduction of 2.6 per cent in the hay acreage. The condition of timothy hay was 84.1, which was 4.2 points higher than last year, 2.6 points lower than in 1899, and 1.7 points below the mean of the August averages of the last nine years.

The reports as to the production of clover are on the whole unfavorable.

During July the changes in the condition of the tobacco crop were wholly unfavorable.

Reports regarding the apple crop are extremely unfavorable. The comparatively low condition reported on July 1 heavily declined during the month. A very poor crop will be gathered.

The condition of hops was higher on August 1 than at the same date in 1900.

The condition of rice was on the whole favorable.

There was a marked impairment in the condition of pastures during July, there being but few States in which declines were not reported.

The average condition of cotton on July 25 was 77.2, as compared with 88.1 on the 25th of the preceding month, 76 on Aug. 1, 1900, 84 on Aug. 1, 1899, and a ten-year average of 84.

In Massachusetts the average condition of corn was 93; the average condition of spring rye, 94; the average condition of oats, 82; the average condition of barley, 83; the acreage of buckwheat, as compared with last year, 100, and

average condition 95; the average condition of tobacco, 92; the average condition of potatoes, 68; the acreage of hay, as compared with last year, 104; the average condition of timothy, 99; the production of clover, as compared with last year, 98, and average quality, 100 standing for high, 95; the average condition of pasture, 96; and the average condition of apples, 46.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM THE UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending July 29. — Excessively high temperatures prevailed over the greater part of the country, especially in the central valleys. Nearly normal temperatures prevailed over the northern portions of the middle Atlantic States, on the south Atlantic coast, and from the lower Mississippi River westward to the south Pacific coast. On the north Pacific coast, in the Lake Superior region, and over the greater part of New England, the week averaged slightly cooler than usual. Good rains fell over a considerable portion of the drought region of the Missouri and upper Mississippi valleys. Abundant rains also occurred in the Dakotas, Minnesota, over the greater portion of the Lake region and in New England. Less than the usual amount fell on the south Atlantic coast, in the east Gulf States and the Ohio valley.

Week ending August 5. — In the upper Missouri valley, over portions of the upper Lake region and northern New England, the week averaged slightly cooler than usual. Nearly normal temperature conditions prevailed in the lower Lake region and Ohio valley and along the Gulf coast. Elsewhere the week was generally warmer than usual. Abundant rains fell during the week in north-eastern Texas, western Arkansas, over portions of Missouri, eastern Kansas and Oklahoma. Showers occurred over a large portion of the upper Missouri and Ohio valleys. There was less than the usual rainfall in the central Gulf States and eastward to the Appalachian Mountains, and no appreciable amount over extensive areas, including the upper Mississippi and Red River of the north valleys and upper Lake region.

Week ending August 12. — The week averaged slightly

cooler than usual in the Lake region, over the northern portion of the upper Mississippi and upper Missouri valleys, and along the immediate California coast. The week averaged warmer than usual on the north Pacific coast, over the plateau regions and eastern Rocky Mountain slope, and generally throughout the southern States and Atlantic coast districts, including the Ohio, central Mississippi and lower Missouri valleys. The rainfall in the Atlantic coast and east Gulf States was abundant. Heavy rains also occurred in portions of the Mississippi and Missouri valleys. The rainfall was deficient in the west Gulf States and from the upper Mississippi valley eastward to the upper Ohio valley and the greater portion of the upper Lake region. Good showers were quite general in the central and southern Rocky Mountain region.

Week ending August 19.—The week averaged slightly cooler than usual in Kentucky, Tennessee, Georgia, Florida, in the southern plateau region and on the California coast. Throughout the northern portions of the country, from the Atlantic to the Pacific, including the south Atlantic and west Gulf States and south-east Rocky Mountain slope, the week averaged warmer than usual. Very heavy rains fell generally throughout the middle, south Atlantic and east Gulf States, and over a large part of the Ohio valley, including portions of northern Illinois and northern Indiana. More than the usual amount also occurred over local areas in the Missouri and central Mississippi valleys and generally over the middle and southern plateau districts. Over much of the Lake region and New England the precipitation was below the average.

Week ending August 26.—The week was cooler than usual in the greater portion of the south-eastern States, in California, Oregon and Nevada. Throughout the plateau region, the west Gulf States, the central valleys, the Lake region, New England and the middle Atlantic States the week was warmer than usual. More than the usual amount of rain fell in the greater portion of the country east of the Mississippi River and in portions of the north-western States, Texas and Louisiana, being heavy in many sections of Illinois, Indiana, Kentucky, Tennessee, the Lake region, the

middle Atlantic and Gulf States. From central Texas northward to Iowa and throughout the Rocky Mountain region the rains were generally light and not well distributed. No rain fell in California.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending July 29.—New England. Boston: Weather favorable; crops much benefited; large crop hay practically secured; corn good, tasselling; potatoes unfavorable, promise light crop; beans good; tobacco made rapid growth, much been topped; apples poor; other fruit fair.

Week ending August 5.—New England. Boston: Weather generally fair and cool; sunshine deficient; rains needed in Rhode Island and southern Connecticut; all crops in good condition, except potatoes, which are improved, but below average; tobacco excellent, cutting will begin in about a week.

Week ending August 12.—New England. Boston: Weather very favorable; all crops improved; outlook for potatoes more encouraging than for weeks, but condition still below average; tobacco good, cutting in operation; apples poor; other fruit good; buckwheat promising.

Week ending August 19.—New England. Boston: Weather moist and warm, causing rapid growth; vegetables excellent, except potatoes, which, however, are better than last week; fruits about average, need sunshine; good corn crop assured; tobacco being cut, satisfactory yield.

Week ending August 26.—New England. Boston: Weather generally favorable; second crop of grass heavy; potatoes and apples light crop; peaches fair; corn excellent, earing well; tobacco injured somewhat by cloudy, humid weather; sunshine, drying and ripening weather needed for all crops.

THE WEATHER OF AUGUST, 1901.

The weather of the month, as a whole, has not been marked by unusual extremes or conditions exceptional to the season. While the temperature has averaged slightly above normal, no very high temperatures occurred, or periods of excessive heat. The nights were seasonably warm. During the first

seven days of the month the daily mean temperatures departed but little from the normal. Then followed a period of four days, from the 7th until the 11th, when the temperature ranged above the normal, with maxima during the time ranging between 85 and 90 degrees. From the 12th to the 15th inclusive occurred another period of temperature near the normal, followed by a warm period of three days, when the maxima again rose to near 90 degrees. During the remainder of the month the temperature was moderate and seasonable, though ranging a few degrees above the normal on occasional days. The average for the entire month was about 1 degree in excess of the normal for August. The cloudiness and sunshine were nearly equal during the first week or ten days, followed by a period extending to the 26th with cloudiness somewhat in excess of the sunshine. During the remaining portion of the month clear and very pleasant weather prevailed. Showers were of frequent occurrence, generally at intervals of three or four days, but the rainfall was in light to moderate amounts until the night of the 24th, when very heavy showers occurred in the greater part of the eastern portion of the State, many stations having amounts between 2 and three inches. Though the rainfall of the month was below the normal, the frequency of the showers, combined with the absence of excessive heat or high winds, made it sufficient to keep vegetation in a flourishing condition. The growth of vegetation was also favored by the somewhat humid atmosphere that prevailed during a greater part of the month, and which on the coast caused considerable foggy weather. With the exception of the heavy showers on the night of the 24th in the eastern part of the State, no severe local storms occurred, either of hail, wind or lightning. In general, the weather conditions were moderate and normal, and favorable for the growth and harvesting of crops.

In the circular to correspondents returnable August 24 the following questions were asked: —

1. What is the condition of Indian corn?
2. What is the prospect for rowen, as compared with a normal crop.

3. What is the prospect for late potatoes, and have you noticed blight or rot?

4. How do the acreage and condition of tobacco compare with former years?

5. What is the prospect for apples, pears, peaches, grapes and cranberries?

6. What is the condition of pasturage in your vicinity?

7. How have oats and barley compared with former years?

8. Is the interest taken by your farmers in poultry increasing, and what proportion does the income derived from poultry products bear to that derived from the dairy?

Returns were received from 164 correspondents, from which the following summary has been made up:—

INDIAN CORN.

Indian corn made a great growth during the month in all sections, and is generally reported as earing well. It is still somewhat backward, and early frosts might do much damage, but with an ordinary season better than an average crop should be secured in all sections.

ROWEN.

On the whole, the crop of rowen promises to be very good, though there are some complaints of fields burning after mowing, and others that the late cutting of the first crop will not give time for the maturing of a large crop of rowen. The rains of the past month have also done much to put mowings in good condition for another season.

LATE POTATOES.

Early potatoes were a very light crop in most sections. Later ones are reported as making a great showing of vines, but the tubers are said not to have set well in most cases and to be few in the hill. The prospect does not point to more than a fair crop. Blight and rot have appeared in all counties, but not to any alarming extent.

TOBACCO.

The acreage of tobacco was again reported as slightly increased throughout the tobacco-growing district. The crop

is generally in fine condition, of large growth and apparent good quality. Cutting was delayed by the rains of the third week of August, but should be practically completed by the close of the month.

FRUIT.

Apples continued to fall off in condition during the month, and the prospect is for one of the lightest crops of winter apples ever gathered. Fall apples are somewhat better, but still not good. A light to fair crop of pears is reported. Peaches promise only a light crop. Grapes generally promise well. Cranberries are a light crop, particularly in the region of commercial production.

PASTURAGE.

There are but few complaints of pastures being otherwise than in excellent condition, the frequent rains of the month having kept the grass green and growing. Unless actual drought prevails, they should carry out well and be in good condition for next season.

OATS AND BARLEY.

Both these crops are below the average for grain, and, generally speaking, for straw also. But little barley is raised, except for forage. As forage crops, both are doing well.

POULTRY KEEPING.

The interest in poultry keeping, as in past years, is increasing, though perhaps not as rapidly as a few years ago. More attention is paid to it in the south-eastern counties than elsewhere, the income from it in that section equalling, and perhaps exceeding, that from the dairy. Correspondents quite generally agree that poultry keeping yields greater profit, in proportion to the capital invested, than most other lines of farming. Attention is again called to the article on "Poultry keeping as a principal feature of diversified farming," at the end of this bulletin, which will be of interest to both farmers and poultry specialists.

NOTES OF CORRESPONDENTS.

[Returned to us August 23.]

BERKSHIRE COUNTY.

Mount Washington (H. M. WEAVER).—Indian corn is above the average in condition. Rowen promises to be better than a normal crop. Late potatoes promise better yields than early ones; no blight or rot. The prospect for pears and cranberries is good; for apples, fair; no grapes or peaches. Pasturage is in good condition. Oats are fully an average crop. There is very little interest taken in poultry, and all the poultry products are consumed on the farm.

Otis (S. H. NORTON).—Indian corn has made a fair growth of late, and is now looking well. Rowen will be an average crop. There is general complaint of a light crop of potatoes; no blight or rot as yet. There will be very few apples in this section. Pastures are in good condition for the time of year. Oats are a light crop. Poultry raising is on the increase.

Tyringham (E. H. SLATER).—Corn is looking well and will be a good crop, but is late. Rowen looks well and promises an average crop. Late potatoes are very small; blight has appeared on a few fields. The acreage of tobacco is fully up to former years, and the crop is a good one and of good quality. Apples a light crop; pears quite plenty. Recent rains have helped pastures, and they are looking well. Oats are a good crop; very little barley raised.

Washington (E. H. EAMES).—Indian corn is in good condition. The rowen crop does not promise very well. Late potatoes are an average crop, with no blight or rot as yet. Apples will be a very light crop. Pastures are not in very good condition, owing to the drought. Oats are about an average crop.

Richmond (T. B. SALMON).—Corn promises an average crop. Rowen will be a good crop. Pears will be about an average crop; other fruits, half crops. Pasturage is in very good condition, the late wet weather having kept it growing. Oats are about a three-

fourths crop; some pieces of barley very good, some very poor. The interest in poultry remains about as formerly; taken on an average, the income from this source is not over 20 or 25 per cent of that from the dairy. Cabbages are looking well. Buckwheat looks well, but there is not as great an acreage as in former years.

Windsor (W. H. TIRRELL).— Indian corn is not a very good crop. The prospect for rowen is very good. There will be but few apples or pears. Pasturage is in good condition. Oats and barley have compared well with former years. The interest in poultry is increasing, but the income derived from it is small.

New Ashford (ELIHU INGRAHAM).— Indian corn is in good condition. The prospect for rowen is better than for some years. Late potatoes are a very good crop, with no blight as yet. The apple crop will be very light. Oats and barley were not half crops. The interest taken in poultry is increasing, and I should judge the income derived from it to be about one-sixth that derived from the dairy.

Florida (E. D. RICE).— Corn looks well, is making a good growth, and the ears are setting well. There will be a very good crop of rowen where the first crop was cut early. Potato tops are green and look well, but the tubers are not numerous; no blight as yet. Apples will be about a one-fourth crop, and pears and grapes look well. The wet weather has caused an abundance of feed in the pastures. Oats were about half a crop; not much barley grown. The interest in poultry remains about as formerly, and the income from it is about one-tenth that from the dairy. The month has been very wet, and some of our farmers are not through haying yet.

FRANKLIN COUNTY.

Colrain (A. A. SMITH).— Indian corn is in good condition. The prospect for rowen is better than usual, owing to frequent showers. Late potatoes promise well, and no blight or rot has appeared. The acreage of tobacco has increased, and the crop is in fine condition. Apples scarce; pears abundant. Pastures are in good condition. Oats and barley compare favorably with former years. The interest taken in poultry is increasing, and the income from it is greater than that from the dairy, according to the capital invested.

Shelburne (G. E. TAYLOR).— Corn is growing finely, but much of it will need another month of fine weather. The rowen crop will be better than usual. There is no blight or rot on potatoes, but they do not grow well, and the prospect is poor. No apples; plenty of pears. Pasturage is in first-class condition. Poultry

keeping is increasing somewhat, but I could not give the percentage of income derived from it.

Conway (J. C. NEWHALL). — Indian corn has made a very heavy growth. The rowen crop is much above the average. Late potatoes appear to be a very light crop; have noticed neither blight nor rot. The acreage of tobacco is somewhat increased, and the crop is looking finely now. Apples a very light crop; pears and grapes more plentiful. Pastures have been in very good condition all summer. Oats and barley are hardly up to former years. Every farmer keeps just about enough hens to supply himself with poultry products.

Deerfield (CHAS. JONES). — Corn is in good condition, but is rather late. Rowen will be a short crop, as the first crop was cut very late. Potatoes are very small and still growing, but will give a light crop. Acreage of tobacco slightly increased and crop good, but some of it a little late; harvesting begun; no damage from hail. Very few apples, pears, peaches or grapes. Pasturage is in fair condition. Oats have proved a light crop. There is very little poultry kept here.

Sunderland (J. M. J. LEGATE). — Corn never looked better; a heavy growth of stover, and very heavily eared. Rowen will be far above an average crop. Late potatoes a poor crop, but with neither blight nor rot. The apple crop is very light; no other fruits raised for market. There is a large increase in the acreage of tobacco, and the crop is looking very well. Pastures were never in better condition at this season of the year. There is very little interest taken in poultry, although it is slightly increasing; every farmer keeps a few hens, but there are very few who keep them at a profit, — perhaps none.

Leverett (W. L. BOUTWELL). — Indian corn is in very good condition. Rowen will be less than half a crop. Late potatoes will be a very poor crop, but there is neither blight nor rot. Tobacco has a larger acreage than usual, and an extra fine growth. The prospect for fruit is good. Pasturage is in poor condition. In general, very little interest is taken in poultry, a small flock left to forage for themselves appearing to be the farmer's idea of profitable poultry keeping.

Montague (C. S. RAYMOND). — Indian corn is in very good condition. Rowen is rather better than an average crop, and is growing finely. Potato tops are still green and appear to be growing, but there will probably be a light crop. Acreage of tobacco increased; growth fine and quality apparently good. Pastures are in excellent condition. Oats and barley are not much grown. The interest in poultry is not increasing to any great extent.

Erving (C. F. CLARK).— Indian corn is an average crop. Rowen promises to be a good crop. The prospect for late potatoes is fairly good, with neither blight nor rot as yet. Apples are very scarce ; pears, grapes and cranberries good. Pasturage is in good condition. Oats and barley are average crops. The interest in poultry is not increasing, but the income derived from it is about half that derived from the dairy.

HAMPSHIRE COUNTY.

Ware (J. H. FLETCHER).— Corn is looking very well at the present time. The prospect for rowen is good, as compared with a normal crop. The prospect for late potatoes is good, with no blight or rot so far. The prospect for fruit is not very good, as compared with other years. Pasturage is in fair condition. Oats and barley are about average crops. Poultry keeping is about the same as in former years, both as to the interest taken and the income derived from it.

Pelham (J. L. BREWER).— Indian corn has made a fine growth and has a good color. Rowen promises a full normal crop. The prospect for late potatoes is good, with neither blight nor rot. There will be a light crop of all kinds of fruit. Pastures are in fair condition. Oats were a light crop, because of the hot weather in July. The interest taken in poultry is not increasing. More money is invested in the dairy than in poultry, hence the income derived from the dairy is greater ; but money invested in poultry yields greater profits than that invested in the dairy. Fall tent caterpillars are many and troublesome.

Granby (GEO. A. BLISH).— Corn is looking well, and is as forward as could be expected, considering the late planting. Rowen promises to be more than an average crop. There will be a fair crop of pears and peaches, but very little other fruit. Pasturage is in very good condition. Oats were all cut for green feed, and were about an average crop. Our farmers are not much interested in poultry, and the income from that source would be a very small per cent of that from the dairy.

South Hadley (H. W. GAYLORD).— Indian corn is looking well and bids fair to be more than an average crop, but is generally a full week later than usual. The prospect for rowen is very poor, as the fields burned after mowing, and no amount of rain later on can repair the damage done. The potato crop is very discouraging, as, while there are potatoes enough in the hill to give a fair crop, they do not seem to grow as they should. Apples will be a light crop ; peaches poor ; grapes good. Pastures are looking

finely, and give promise of an abundance of fall feed. In many fields oats have rusted badly, and the straw has been short. The interest in poultry is on the wane, principally because so many summer eggs are held in cold storage for winter use that the prices for strictly fresh winter eggs have fallen off.

Hatfield (THADDEUS GRAVES).—Indian corn was never in better condition than now. Rowen will be a little above an average crop. The prospect for late potatoes is not flattering, though there is little blight or rot. The acreage of tobacco is increased 10 per cent, with the prospect for the crop fine. Pastures are in good condition. No barley and few oats are raised. No interest is taken in poultry by our farmers.

Williamsburg (F. C. RICHARDS).—Indian corn is looking finely. The prospect for rowen is good. Late potatoes are not an average crop, but there is no blight or rot as yet. Acreage of tobacco nearly the same as usual, but condition uneven. Apples light; pears a fair crop; no peaches. Pasturage still holds good. Oats were a good fair average crop. The interest in poultry is not increasing, and hardly enough is kept to form an estimate as to the income derived from it.

Cummington (S. W. CLARK).—Indian corn has made a good growth, but is a little late. Rowen is rather better than an average crop. The prospect for late potatoes is good, and no rot has appeared. There will be very few apples; other fruit not much grown. Pasturage is in very good condition. Oats and barley were normal crops. The income derived from poultry is but a small per cent of that from the dairy, and the interest taken in poultry is not increasing.

Huntington (H. W. STICKNEY).—Corn has made a great growth, and is looking finely. The prospect for rowen is very good. Late potatoes have commenced to rot on wet land. Fruit of all kinds will be a very light crop. Pastures are in very good condition, and the frequent showers have started up the feed. As a general thing, oats and barley are not as good crops as usual. Never knew so many chickens to be raised in one year in this town as there have been this year.

HAMPDEN COUNTY.

Tolland (E. M. MOORE).—Indian corn is not quite up to the average, and is ten days late. Rowen will be a light crop. Potatoes will give a small crop, but neither blight nor rot has appeared. Apples are not bearing this year; grapes and cranberries are plenty. Feed is getting short in pastures. Oats and barley will not be quite average crops.

Blandford (E. W. BOISE). — Indian corn is a good crop, but fully two weeks late. The prospect for rowen is fairly good. Late potatoes have improved in the past ten days, and the crop should be fair; neither blight nor rot has appeared. Virtually no apples; pears about 80 per cent of a crop; few peaches or cranberries. Pastures are fully up to the average, the recent rains having given them new life. Oats and barley are about 80 per cent of a normal crop.

Russell (E. D. PARKS). — Corn is in very good condition. Rowen is a full average crop, and above the average on some farms. Potatoes are improving, but a light crop is expected. Fruit of all kinds will give a very small crop this season. Pastures are in very good condition for the season of the year. Oats and barley are up to the usual average. I think the interest in poultry is increasing, and that the income derived from it is fully one-fourth that from the dairy.

West Springfield (J. N. BAGG). — Corn is in good condition. Rowen never looked better than at present. The potato tops are green and the tubers are growing; no blight or rot as yet. Acreage of tobacco increased, and condition of crop promising. Apples light; pears abundant; other fruits scanty. Pasturage is in very good condition. The interest in poultry is increasing among our farmers. Weeds have been unusually rampant, and those who have conquered them have done so at large cost. Pole beans are a partial failure, the leaves being spotted and the pods few.

Longmeadow (W. F. EMERSON). — Indian corn has grown well and is ripening slowly. The weather has been very favorable for the rowen crop. Late potatoes promise much better than the early ones; no blight or rot as yet. Very little tobacco raised here, and no change to note. The prospect is good for all kinds of fruit, with this drawback, that large crops sometimes produce small fruit. Pasturage continues in good condition. Oats are a very small crop, and short straw; evidently the weather has been too warm. The interest in poultry is apparently increasing in every direction in comparative ways, though not generally in the way of large plants which are made the principal business of the farm.

Hampden (J. N. ISHAM). — Corn has made a rapid growth and is earing well. A good crop of rowen is in prospect on early cut land. Late potatoes promise well; tops ripening a little early, but no real blight or rot. Apples short supply, pears good and peaches extra. Pastures are holding out green and are still growing. Oats and barley are average crops. The interest in poultry is increasing, and the income derived from it is nearly one-tenth that from the dairy.

Wales (C. F. CRAWFORD). — Corn looks well, but I think the stover will be better than the grain. Hay was cut late, which makes the rowen crop short. The yield of potatoes is light; no rot as yet. Apples are rather a light crop; all other fruits bear heavily. Pasturage is never worth much at this time of the year. Oats and barley will make about average crops. There is not much interest taken in poultry; income derived from it perhaps 15 per cent that from the dairy. Buckwheat is quite a common crop, and is doing well.

WORCESTER COUNTY.

Dudley (J. J. GILES). — Indian corn is growing nicely, but is ten to fourteen days late. The rowen crop started unusually early and it will undoubtedly exceed the normal. Late potatoes are a fortnight late, and will give a good crop if there is no frost until late in September; no blight or rot as yet. Pears, grapes and cranberries are full crops; apples a failure. Pasturage is in good condition. Oats are short in straw and somewhat rusty. The interest in poultry is not increasing.

Brookfield (F. E. PROUTY). — Corn is in good condition. Rowen promises a good crop. There is no blight or rot on potatoes, but the prospect is for a light crop. Apples but few; pears good; grapes good; cranberries few. Pasturage is in quite good condition. Oats and barley are not more than half crops. The interest in poultry is increasing, but the income is not one-tenth that from the dairy.

West Brookfield (L. H. CHAMBERLAIN). — Indian corn is in good condition. Rowen will be a full normal crop. Late potatoes promise a light crop; very little blight and no rot. Apples a very light crop; pears and grapes plenty; peaches light. Pasturage is in first-class condition. Oats for forage are a good crop. The interest in poultry is not increasing with our farmers, and the income from it is much less than that from the dairy.

New Braintree (C. D. SAGE). — Corn is doing well. The prospect is that there will be a fair crop of rowen. Have not noticed blight or rot on potatoes, but the crop is poor. Apples very few; pears a fair crop; no peaches; grapes a poor crop. Pastures are in very good condition for the time of year. Oats and barley are fair crops, but hardly an average yield; mostly cut for fodder. There is rather less interest taken in poultry than formerly.

Petersham (S. B. COOK). — Indian corn is a little late, but is making a good growth of stalk and the ears are filling well. There will be a full normal crop of rowen. The prospect is good for late

potatoes, with no blight or rot as yet. Apples very few; pears and grapes fair crops. Pastures are in excellent condition. Oats are lighter than usual; barley about an average crop. The interest in poultry is not increasing, but the income from it is about one-fourth that from the dairy.

Templeton (LUCIEN GOVE).—Corn is uneven and somewhat later than usual, with the later planted the best. A fair crop of rowen is in sight,—better than for two years. Potatoes a light crop, with few in the hill; no blight or rot as yet. Apples are very light; some pears; no peaches; grapes fair. The condition of pasturage is quite good for the season. Oats and barley are light crops and very uneven. The interest in poultry is increasing to some extent, and the income from that source is probably 30 per cent of that from the dairy.

Ashburnham (E. D. GIBSON).—Indian corn is but little behind an average season, and is growing finely. With plenty of rain, there will be three-fourths of a normal crop of rowen. The prospect for late potatoes is much better than a month ago; no blight or rot. Apples very poor; pears good; no peaches; grapes good; cranberries good. Pasturage is in fair condition, but will soon need rain. All grain crops are much below the average. I do not think farmers keep more poultry than they did five years ago; could not say what proportion income from poultry bears to that from the dairy, but it is less.

Bolton (H. E. BABCOCK).—Corn is looking well, and will give a full average crop. There is prospect of a good crop of rowen. Late potatoes promise well; no blight or rot as yet. Very few winter apples; pears plenty, also grapes; not many cranberries. Pastures are in very good condition. Oats and barley are light crops. The interest in poultry is not increasing, and the income from it is very small compared to that from the dairy, though it may be as large for the money invested.

Northborough (J. K. MILLS).—Corn is growing well, but will be late. The prospect is that the rowen crop will be larger than that of last year. Late potatoes promise well; no blight or rot. Apples will be a light crop; other fruits good. Pastures are extra good for the time of year. Oats and barley are rather light crops. The interest in poultry is increasing, and the income is about 30 per cent of that from the dairy.

Worcester (H. R. KINNEY).—Indian corn has made a very rank growth, but is late about earing. The rowen crop will be fully up to the average. Late potatoes look finely; some blight, but no rot as yet. Apples are very poor; pears and peaches good; grapes fair. Pasturage is in good condition for the season. The

acreage of oats and barley is very small, and barnyard millet is being tried as a substitute. There has been an increase in the poultry business this season, the use of incubators being more popular than ever before; and, while the hatch was not good, there are more chickens than usual. The income derived from it is probably more than one-fourth that from the dairy.

Millbury (HERBERT McCRAKEN).—Corn is a very good crop in this vicinity. Rowen is better than usual. The prospect for late potatoes is very poor, and blight has been noticed. Apples poor; pears good; peaches, grapes and cranberries fair. Pasturage is in very good condition, the best for years. Oats and barley are very light crops. The interest in poultry is not increasing among our farmers.

Hopedale (DELANO PATRICK).—Indian corn is looking remarkably well, though it is rather backward. The prospect for rowen is uncommonly good. Late potatoes are but few in the hill and small, though the tops look well; no blight or rot as yet. The prospect was never so poor for apples, but grapes look well. Pastures are in first-rate condition. The interest in poultry is about the same as usual, and the income derived from it very much less than that from the dairy.

Uxbridge (AUGUSTUS STORY).—Corn is two weeks late, but looks well and will yield a fair crop. Rowen is not up to a normal crop. The prospect for late potatoes is fair, and there is but little blight or rot. No apples; pears, peaches and grapes a good yield. Pasturage is not up to the normal in condition. Oats and barley are good crops. There is no increase in the interest in poultry, and the income from the dairy is a third greater than that from poultry. Our crops are late, and early frosts would be disastrous.

MIDDLESEX COUNTY.

Marlborough (E. D. HOWE).—Indian corn has caught up with the season. Rowen is 25 per cent above a normal crop. Late potatoes look well now, and blight is not prevalent. Apples 10 per cent of a full crop; pears, 50 per cent; peaches, 50 per cent; grapes, 100 per cent. While fed close, pasturage is green and growing. Oats and barley are both very light crops. The interest in poultry remains as usual; some farmers derive all their income from poultry, others little or none; perhaps 25 per cent of the income from the dairy would be a fair estimate for all the farmers in town.

Ashland (CHAS. E. ADAMS).—Indian corn is in good condition. Not much rowen will be cut. The prospect for late potatoes

is poor; no blight or rot as yet. Pears and grapes will give good crops; other fruits poor. Pasturage is in good condition. The interest in poultry is not increasing, but there has always been a good interest taken, and the income from it is probably twice that from the dairy.

Maynard (L. H. MAYNARD). — Corn looks well and promises a full crop. The rowen crop will be above the normal. Potato vines look remarkably well, but the crop seems uncertain, although the tubers are growing well now; no blight or rot. Pears, peaches, grapes and cranberries are full crops; apples poor, and early varieties a complete failure. Pastures are in good condition, owing to the abundant rains. Oats for fodder were a failure in many cases, being of small growth. Poultry raising in this section is not increasing; although most farmers keep a few hens, there are no poultry raisers who make a specialty of it.

Pepperrill (P. J. KEMP). — Indian corn is making a very rapid growth, and if frost holds off there will be more than an average crop. Most fields are covered with a heavy crop of rowen. Late potatoes look like a light crop, there being but few in a hill. Apples a very light crop; pears fair; peaches light; grapes fair. Frequent showers have kept the pastures in very fair condition. Oats and barley are about average crops. The interest in poultry is increasing, and the profit is double that to be made in dairying.

Tewksbury (G. E. CROSBY). — Indian corn is in good condition. Rowen is looking better than for the last two years. Blight is apparent in some fields of potatoes, with a slight tendency to rot. Apples scarce; pears good; no peaches; grapes plenty; cranberries fair. Pastures are in good condition. Oats and barley for forage are very good crops. Poultry raising seems to be nearly a failure here this year, and the interest is certainly not increasing; not much profit in either the dairy or poultry.

Bedford (HENRY WOOD). — Corn is in very good condition. A good crop of rowen is looked for, and it is now looking well. No blight or rot has appeared on potatoes. There are no apples of any amount; a few early ones only. Pasturage is in very good condition. Oats and barley are not as good crops as usual. There is considerable interest in poultry, but not as much as in the dairy.

Concord (W.M. H. HUNT). — Corn looks very well, but there is some complaint of smut. There will be a good crop of rowen. Potatoes will be a light crop, but have not noticed blight or rot. Winter apples very light; no peaches; fair crop of pears. Pasturage is in very good condition. Oats and barley are fair crops.

There is no increase in poultry growing, and the income derived from it is small. The set of fruit on tomatoes is very light and the vines very rank. Squashes are doing fairly, and melons the same.

Burlington (C. E. MARION). — The prospect for rowen is fair. Late potatoes look well, but the early crop blighted somewhat. The prospect for apples is poor; pears light; no peaches; grapes light; cranberries light. Pastures are in good condition. Oats are not a heavy crop, but barley looks well. There is not much interest in poultry, except with a very few. All vegetables look finely except squashes, which are poor compared with former years.

Wakefield (CHAS. TALBOT). — Indian corn never looked better, although it will be a little later than usual. The prospect for rowen is better than for years. Potatoes are not as good a crop as for some years past. No apples or peaches; pears, grapes and cranberries in abundance. Pasturage was never in better condition. Oats and barley are about the usual crops, except that oats have rusted badly. The interest in poultry is increasing, and more money is made in it, considering the money invested, than in any other stock.

Stoneham (J. E. WILEY). — There is not much Indian corn raised in town, but what there is looks well. Rowen will be a good crop. Late potatoes are a poor crop. Apples poor; pears fair; grapes good. Pastures are above the average in condition. But little if any oats and barley are raised. I do not think the interest of our farmers in poultry is increasing, and they differ in opinion as to the profit to be derived from it.

Weston (H. L. BROWN). — Corn is in good condition. There will be a good crop of rowen on all early cut fields. There is no blight on potatoes as yet; the vines look well, with but few tubers. No winter apples; pears and peaches good crops; no cranberries and but few grapes grown. Pastures are in very good condition when not overstocked. Oats and barley are not grown except as a fodder crop. The interest in poultry is about the same from year to year; a few make poultry a business, but the income from it is only a small fraction of that from the dairy.

ESSEX COUNTY.

Amesbury (F. W. SARGENT). — Acreage of corn small and condition fair; probably an average crop. Rowen is very good, and some is being cut now. Potato tops look well, but the tubers are

few and small as yet. There will be very little fruit excepting grapes, which are good. Frequent showers keep pasturage growing, and it is in very good condition. Oats and barley are not grown except for fodder, and are fair crops. This is a good poultry section, and profits compare favorably with those from dairy products.

Groveland (ABEL STICKNEY).—Indian corn is looking finely, but is late, and will need an open fall to ripen well. Rowen is more than an average crop. The prospect for late potatoes is good, with no blight or rot as yet. Apples very poor; pears good; peaches not great; grapes average. Pasturage is not very good, but better than an average year. Oats and barley are all cut green. Poultry raising is not increasing very fast, but the profit from it is 25 per cent greater than from the average dairy herd.

Andover (M. H. GOULD).—Indian corn is looking well. Rowen is a third more than a normal crop. The prospect for late potatoes is very poor. Fall apples fair, no winter apples; heavy crop of pears; no peaches or grapes; cranberries good. Pasturage is in good condition. Oats and barley are good average crops. The interest in poultry is increasing, but the income of the majority of our farmers is mainly from the dairy.

Topsfield (B. P. PIKE).—Indian corn is looking well, and will be a full crop. There will be some rowen, but not a full crop. There is no blight on potatoes, and they are growing well. No apples, peaches or cranberries, but some pears. Pastures are in fair condition. Oats and barley are not raised for grain. The interest in poultry is not increasing, and the income derived from it is only about 8 per cent of that from the dairy.

Wenham (N. P. PERKINS).—Corn is not much raised, but what there is, is in fair condition. On early cut, well-manured fields there will be a fair crop of rowen; not much on late cut fields, but more than last year. Potatoes are a poor crop and there is some complaint of rot, though not much as yet. No apples; pears average; but few peach trees; not enough cranberries to be of any account. Pastures are in fair condition, but milch cows are fed largely at the barn. I do not think the poultry business is increasing any, and the income is not more than one-fifth that from the dairy. Squashes are almost a complete failure, the vines having died. Onions are doing well. Carrots are small and poor, and cabbages are already showing some signs of blight.

Danvers (C. H. PRESTON).—Indian corn is in good condition. Rowen will be a very good crop. Late potatoes are not promising, but there is no blight as yet. No apples; pears a full crop;

no peaches; grapes average. Pastures are in good condition. Oats and barley are good crops for forage. The interest in poultry is increasing with our farmers.

NORFOLK COUNTY.

Avon (S. F. OLIVER). — Indian corn is but little raised except for fodder. Rowen is doing well, and promises an extra good crop. Late potatoes look well, without signs of blight or rot. The fruit crop as a whole is unusually light. Pasturage is in good condition, rather better than common. Nearly all our farmers keep poultry, and more attention is paid to raising high-grade birds for exhibition than to market poultry.

Canton (E. V. KINGSLEY). — Indian corn is in very good condition, and is growing very fast. Rowen will be a large crop. Late potatoes are looking good, and are growing very fast; some rot has appeared recently. Apples very short; pears, peaches, grapes and cranberries good. Pasturage is in excellent condition. Oats very poor; barley good. There is some increase of interest in poultry, but the per cent of income from it is small, as dairying is the principal occupation of our farmers.

Millis (E. F. RICHARDSON). — Indian corn is in good first-class condition. Rowen will be a good big crop. Late potatoes will be a fair crop if blight does not affect them. Pears, peaches and grapes plenty; apples and cranberries few. Pasturage is in excellent condition. Oats and barley are fair crops. The interest in poultry is increasing, but the income from dairy products is away ahead of that from poultry.

Medway (MONROE MORSE). — Corn is in very good condition. Rowen promises to be a good crop. Potatoes have made an abnormal growth this year, but up to the present time it is mostly tops, and what tubers there are have a tendency to be knobby. There are almost no apples, but pears, peaches and grapes are good crops. Pastures are in unusually good condition. Oats and barley are grown only for fodder.

Franklin (C. M. ALLEN). — Corn is backward, but is looking very strong and healthy. Rowen will be more than an average crop. There is some blight on potatoes, and the tubers are few to the hill. Apples few; pears light; peaches good; grapes medium; cranberries look well. Pastures are in the best condition for a number of years. Oats and barley are average crops. The interest in poultry is increasing, and the income from it is better than that from the dairy.

Foxborough (E. A. MORSE). — Indian corn never looked finer. .

The rowen crop is above the average. Late potatoes will be a good crop, with no blight or rot as yet. Apples a small crop; pears, peaches and grapes good; also cranberries. Pasturage is in good condition for the time of year. Oats and barley for hay are not yielding as well as usual.

BRISTOL COUNTY.

Norton (Wm. A. LANE).—Indian corn is in good condition. Rowen looks well, and there is the prospect of a good crop. Potatoes are a failure in this section. There will be a light crop of all kinds of fruit. Pasturage is in fair condition. Oats are a failure, and there is no barley raised. I think that the interest in poultry keeping is increasing among our farmers.

Attleborough (ISAAC ALGER).—Indian corn is in full average condition. Rowen promises to give an average crop. There are not many potatoes, either early or late. No apples; pears plenty; grapes fair; cranberries a small crop. Oats are a poor crop. Not much interest is taken in poultry. Dry weather and fire worms have injured the cranberry crop very much.

Westport (A. S. SHERMAN).—Indian corn is in very good condition. There is a large crop of rowen. Potatoes are drying up rapidly because of blight, and some rot has appeared. Apples are a small crop; pears plenty; peaches and grapes plenty; cranberries very few. Pastures are in very good condition. Oats have been a failure, and barley is not much raised. The interest in poultry is increasing, and the income from it is one-third that from the dairy. Cabbages and turnips are doing well.

Dartmouth (L. T. DAVIS).—Corn has made a very rapid growth during the past month, and is nearly up to the normal. Rowen is not quite as promising as in some years. The prospect for potatoes is very poor in this section. Apples one-fourth of a crop; pears 80 per cent; peaches 90 per cent; grapes 100 per cent. Pasturage is rather short, unless we use mowings. Oats and barley are much less than average crops. Poultry keeping is rather on the increase, and the income from it perhaps one-third that from the dairy.

Acushnet (M. S. DOUGLAS).—Corn is in good condition. Rowen is just an average crop, the weather having been too dry for its best development. Potatoes are poor and rotting badly, with much blight also. Few apples and peaches; plenty of pears, grapes and cranberries. Pastures are in fairly good condition. Poor crop of oats and barley. More people are going into poultry raising every year, and I think there is more money received from poultry and eggs in this town than for dairy products.

PLYMOUTH COUNTY.

Hingham (G. P. Low). — Indian corn looks well, but is from seven to ten days late. Rowen promises to be a large crop. Late potatoes are growing well; no rot reported. No apples of any account; pears and plums abundant; some peaches; grapes good. Pasturage unusually good in this vicinity. Oats and barley have done poorly. Poultry products far exceed dairy products in this locality. The farmers here are largely increasing their poultry establishments, many making poultry their exclusive business. Large brooder houses are being erected every season, and the business appears to be fairly profitable.

Hanson (DR. E. S. THOMAS). — Corn is in good condition. The prospect for rowen is more than normal. Potatoes are small, with the prospect of blight. Fruit of all kinds will be poor. Pasturage is in excellent condition. Oats and barley are not much raised. The interest in poultry is not increasing. Outlook for pumpkins and squashes poor. Grand crop of summer garden stuff.

Duxbury (S. P. SOULE). — Corn is looking well. Rowen will be rather better than usual. Potato tops are looking extra well, but some fields within a few days show signs of blight; no rot as yet. Apples scarce; pears, peaches and cranberries fully up to the average; grapes affected by mildew. Pastures are in good condition. Oats and barley are good crops. The interest in poultry is not increasing to any extent, but the value of the products is about equal to that of those of the dairy.

Kingston (GEO. L. CHURCHILL). — Corn is in fair condition. Rowen will be a very fair crop. The prospect for late potatoes is fair, and there is some blight. There will be a very small crop of apples; pears and cranberries fair. Pastures are in very good condition. Oats have been a good crop. The poultry business is increasing yearly, and seems to be quite profitable for those who make a study of it.

Bridgewater (ROWLAND CASS). — Indian corn is later than usual, but is in good condition. Owing to the lateness of cutting the first crop, rowen will be light. Potatoes will not be as good as the tops would indicate; some blight and a small amount of rot. Apples poor and pears good. Pasturage is in good condition. Oats and barley are very light crops. The interest in poultry is not increasing.

Lakeville (N. G. STAPLES). — Indian corn is in good condition. There is a fair prospect for rowen. The prospect for late potatoes is poor, with no blight or rot. There are few apples; pears

fair; no peaches; grapes plenty. Pastures are getting rather dry. The poultry business is about the same as in years back.

BARNSTABLE COUNTY.

Bourne (D. D. Nye). — Indian corn is in very good condition. Rowen promises to be a very good crop. The prospect for late potatoes is poor; no blight or rot, but some damage from white grubs. Apple crop almost a failure; pears quite plenty; some grapes; one-fourth crop of cranberries. Pasturage looks finely. Oats and barley are very good crops; none raised for grain. Poultry keeping is not increasing, but the income from it is about equal to that of the dairy.

Mashpee (W. F. HAMMOND). — Corn is above the average in condition. Rowen will be about an average crop. Late potatoes bid fair to be an average crop, with no blight or rot as yet. Apples, pears and peaches one-third crops; grapes and cranberries half crops. Pastures are above the average in condition. Oats are half a crop. The poultry business is increasing, and the income from it is about one-half that from the dairy.

Barnstable (JOHN BURSLEY). — Corn is in good condition. Rowen will be three-fourths of a normal crop. Blight is noticed on some potato fields. Apples are a very light crop; pears fair; peaches light; grapes and cranberries very good. Pastures are in good condition. Oats are nearly a failure; no barley grown. Poultry farming increases rather than decreases, and the income from it is two-thirds that from the dairy.

Dennis (JOSHUA CROWELL). — Indian corn is in good condition. Rowen will be a full average crop. Late potatoes look well, with no blight or rot as yet. Apples scarce; pears average; cranberries small crop. Pasturage is in very good condition. Oats have compared well with former years. The interest in poultry is increasing, and the income from it is nearly equal to that from the dairy.

Orleans (F. E. SNOW). — Indian corn is in good condition. Rowen will be a fairly good crop. Potatoes are looking quite well, with no unusual amount of blight or rot. Fruit in general will be rather a scant crop. Pastures are in quite good condition. Oats are a poor crop. There is more poultry keeping than farming in town, and many are doing well. I think the interest increases, and far more money comes in from poultry products than from dairy products.

Wellfleet (E. S. JACOBS). — Corn is in favorable condition, and promises to be a very good crop. Rowen is more than an average

crop, and promises a good supply. Potatoes are below the average; no blight or rot as yet. The prospect for apples is very poor; pears more plentiful; peaches rotting on the trees; cranberries very plenty. Pasturage is very good for the time of year. There seems to be but a slight increase in poultry, but it stands very much in advance of the dairy as a source of income.

DUKES COUNTY.

West Tisbury (GEO. HUNT LUCE). — Indian corn is in very good condition. Rowen will be a poor crop. The prospect for late potatoes is poor, but blight or rot have not appeared. Apples poor; pears and grapes average. Pasturage is in good condition. Oats and barley are less than average crops. The interest in poultry is not increasing, but the value of the products is about equal to that of those from the dairy.

BULLETIN OF
MASSACHUSETTS BOARD OF AGRICULTURE.

POULTRY KEEPING AS A PRINCIPAL FEATURE OF
DIVERSIFIED FARMING.

By JOHN H. ROBINSON, *Editor of "Farm Poultry," Boston, Mass.*

In the issue of the crop report for August, 1900, Dr. A. A. Brigham very concisely and plainly presented the elementary facts in regard to poultry keeping on the farm.

When I was asked to prepare an article for this issue on some supplementary line, two good reasons for discussing the relations of poultry keeping and other branches of agricultural work at once presented themselves to my mind. In the first place, the need of such discussion — the advantage to farm poultry keepers of a proper presentation of the facts in the case — has been very forcibly impressed upon me by what I have seen in the course of a series of visits to poultry farms, extending over some four years' time, and including farms in many sections of the country, but mostly in eastern Massachusetts and Rhode Island. In the second place, I had recently given a great deal of thought to this subject, and therefore felt better able to present it at short notice. Whether my judgment on this last point was good, or the reverse of good, the reader must determine.

POULTRYMAN OR FARMER POULTRYMAN.

It has been a serious and too common error of poultry farmers in recent years that they have made themselves poultrymen, and nothing more. Many have gone even further in the wrong way, and have tried to make of themselves specialists in a single branch of poultry keeping. With a few notable exceptions, those who have limited their effort to narrow special lines have not made

their operations with poultry financially successful. Single, separate branches of poultry culture have rarely been made profitable as all-year-round exclusive occupations. It is worth while to note and remember this, because some very plausible arguments in favor of extreme specialization in poultry culture are sometimes advanced, and their partial presentation of the facts is often so alluring that many people are persuaded into doing what is soon found to be unprofitable.

When a man who knows little or nothing about poultry and as little about growing farm crops writes to ask me if it is possible for him to stock a farm with poultry, conduct it as a poultry farm, and at the same time produce on the farm the food for the poultry, I answer most emphatically that it is not,—not for him. When a good poultryman who is no farmer asks a similar question, I do not feel warranted to encourage him to try to do more, at first, than grow a part of the food for the fowls, preferably such things as cabbage, mangels, turnips, grain to be fed in the sheaf, not attempting the growing of grain crops on a large scale until he is more sure of his ground. But the case of the farmer engaging in or extending operations in poultry keeping is quite different. He is generally somewhat of an expert in crop growing, and, even though he may not have given special attention to poultry culture before, is apt to be pretty well grounded in general methods of caring for live stock. He, therefore, is in a position to begin at once to combine poultry keeping with his other farming.

METHODS OF POULTRY KEEPING COMPARED.

It was a surprise and something of a disappointment to me, coming from a western State, to find so many of the farmers of New England who were giving special attention to poultry adopting the back-yard methods of the city poultry keeper, thus throwing away some of the positive advantages the farm offers the poultry keeper, and taking instead the doubtful advantages of modern intensive methods of poultry culture. I would not be understood as decrying these intensive methods. They are good methods,—under some conditions they may be the best methods; but they are not—except when greatly modified (that is, when less intense)—good methods for the farmer, and I do not think they are the best methods of poultry keeping. And, while it is true that many special poultry growers have succeeded with poultry, while neglecting the crop-producing possibilities of their farms and buying practically all food for their fowls, the experience of those who grow a part or all of their food convinces me that such a combination is to be the favorite combination including poultry

keeping. I find, too, that a majority of the progressive poultry farmers of my acquaintance are working toward this combination.

The possibilities in this combination will, perhaps, come out more clearly if we review briefly the conditions of poultry culture in that wide area of the central west which produces a large surplus of poultry products, and indicate some of the most striking points of contrast between western farm methods and the intensive methods which obtain in towns everywhere and on many eastern poultry farms. There are many other eastern farms where distinctively *farm* methods are in vogue, but in the west we find them more nearly universal, and find almost nothing of the intensive method outside of the towns.

The farm flock of laying hens ranges in numbers from 50 or 60 to 250 or 300, 100 to 150 being perhaps the usual numbers for average farms. The annual crop of chickens will range from 100 to 150, up to 400 or 500, 200 to 300 being perhaps a fair average.

The points of present interest in regard to the handling of these flocks are: That the labor of caring for them rarely interferes to any serious extent with the other work of the farm, being performed either by women, in the intervals taken from housework, by children, or by the men as a part of the "chores." The stock is not allowed to become so numerous that the care of it becomes burdensome. That the fowls, both old and young, pick the greater part of their living, subsisting mainly on food obtained by foraging, and which would otherwise be wasted. What salable food is fed them is not expensive, the actual cost of it being only the cost of production.

Under such conditions the receipts from poultry products are almost clear profit. In many cases, considering that the eggs and poultry consumed by the family pay for salable food consumed by the fowls and for labor, the total receipts are profit. In few cases is there any cash outlay worth mentioning on account of the poultry; so that, even with a low rate of production of eggs and with heavy losses of chicks, there is not a loss which the poultry keeper feels, — a loss which drains his pocket-book.

Compare and contrast such conditions with those which obtain under intensive methods, where as many as 400 hens may be kept on an acre of land, and where five to ten acres is considered ample room for several thousand head of young stock. In the case supposed the poultryman buys all food. The consumption of food by the laying hen goes right on, whether she is producing eggs or not. A few thousand head of young stock may consume hundreds of dollars worth of food before any of them are ready for market. Under such circumstances the poultryman must either have capital

sufficient to carry his stock through unproductive periods, or must work and plan to secure in some way sufficient income to pay current expenses. Failing at these points, he must ultimately go out of the business. If he has stock enough to take all his time, that prevents his making a few dollars elsewhere when the dollars from poultry are not coming in, thus making him wholly dependent upon his poultry for an income and a living. His crowded stock requires, proportionately, far more labor to keep it healthy and productive than does stock kept under the half-natural conditions on the general farm. It must produce better to pay for the food he buys for it and for his labor, and he must strain every nerve to avoid losses, for every chick or fowl lost must directly or indirectly be paid for in cash. No exclusive poultry business could stand such a percentage of loss as occurs on the average farm.

With sufficient capital and ability, many persons have made a success of poultry keeping by intensive methods. No doubt some succeed this way who would not succeed if they attempted to combine poultry keeping with farming. But that does not prove that it is the best way or the most profitable for the greatest number of poultry keepers; and the present evident reaction from intensive methods furnishes good evidence that those who have tested them have often found them wanting. Poultry keeping readily enters into combination with almost every branch of agriculture, and the attempt to keep it entirely separate generally does violence to its development along natural lines.

LEAKS IN EXCLUSIVE POULTRY KEEPING.

It has been said that poultry keeping is readily combined with almost any branch of agriculture. It may also be said that poultry keeping naturally combines with several branches of agriculture. When one undertakes to limit his effort to an exclusive poultry business, he is likely to find that there are some very practical objections to that course, and that circumstances combine to force him to engage in several side lines of work.

Fowls must have shade. Fruit trees and vines planted in the yards will furnish shade, and will grow and bear better than under almost any other conditions. So, almost without thinking about it, many poultrymen drift into fruit growing on a small scale.

A large stock of fowls makes in the course of a year a great deal of very valuable manure, the greater part of which is lost to the poultry keeper, unless applied to crop-producing land on the same farm. The night droppings, which can easily be collected and kept in condition to sell, constitute but a small part of the manure made. The most of it falls either on the earth floor of

the poultry house, there to be mixed with the sand or earth of the floor, or with this and the broken leaves, straw or other material used for litter, or is deposited on the ground on which the fowls run outside. None of this manure is salable, but every bit of it can be utilized. Moreover, if it is not utilized, it will sooner or later poison the land wherever deposits of it are very abundant, making it unfit for poultry and often causing disease and loss to such an extent that the poultry ceases to be profitable. Whether a poultry keeper makes use of the manure or not, he must take care that it shall not remain in such places or in such condition that it is a danger and a menace to the health of the fowls. The rough of the droppings on the floor of the poultry house must be removed at frequent intervals, and once a year, at least, the earth floor must be removed to a depth of four or five inches, and renewed. Labor is required to thus renew the floors of the houses yearly; and if the soil taken out is not utilized, or is used simply as so much rubbish to fill a hole or ditch, the cost of this labor must be paid for directly out of the cash receipts. If this soil, saturated and thoroughly mixed as it is with hen manure, can be applied as a top-dressing to grass land, its value for this purpose will more than compensate, in the increase of the next year's hay crop, for all the labor of renovating the floors. Of course this soil is useful for many other crops, but I have mentioned this one as that to which it is most generally applied. I have seen on farms in this State pieces of mowing land heavily dressed year after year with hen manure and soil from the poultry houses and yards, when the annual cut was sometimes as high as four and five tons per acre.

The droppings deposited outdoors are to be considered next. When hens are kept in small yards, these have to be treated much as the floors of the houses are. Even with much larger yards, something must be done to purify the soil. If the yard, though not very small, is not large enough to be kept permanently in grass, frequent spadings are necessary to keep it in habitable condition; and these mere spadings or stirrings of the soil, while they improve it, do not put it in perfect condition. Nothing will do that like growing a crop on it. If the yard is large enough to be kept in permanent sod, but still so small or so heavily stocked that every part of it is trampled over by the fowls many times a day, the condition is not much better; the sod, undisturbed from year to year, becomes poisoned as the bare earth would, and the common result is a slow poisoning and slow but sure deterioration of the poultry stock, even when conditions are not bad enough to produce malignant disease.

In the localities in this State where soft roasters are grown extensively for the Boston market, intensive methods are necessarily pursued; but the strictest care is taken to prevent poisoning of the ground over which the chickens run each year. After a crop of chickens is all sold,—the last of them generally going to market in July,—the fences are all removed and the whole plot of ground occupied by the yards is plowed deep and sowed to winter rye. Thus the ground is thoroughly cleansed each year, and at the same time the work of purifying it is paid for by the crop of green rye, which furnishes green food to the next crop of chickens.

So far we have not considered the manure from the young stock grown for laying and breeding purposes. A considerable part of this, deposited in coops, brooders and brooder runs, must be handled like that of the general stock collected from the houses or deposited in the yards. But, to secure the best possible development of the growing chicks, they must be given good, clean range from the weaning age until maturity. It is possible to give them such range on ground that is not productive. They will do well on light sandy or gravelly soil that is washed clean of their droppings by every heavy rain. They will do well on a field so full of boulders that it can neither be tilled nor mowed. But the loss of manure under such conditions is considerable, and it is an absolute loss. Besides, while chicks do well on such land as has been described, they do as well or better on good grass land; and, as chickens grown for stock or laying purposes are rarely large enough to be distributed over a range in roosting coops until about haying time, it is possible to use the same land to grow a crop of grass, and after that as a range for chicks, and thus utilize on this land every bit of the manure they make during the season, it being spread thinly and quite evenly on the land as the chickens range over it. Running chickens on this land prevents cutting a second crop of grass the same season; but as cows and chickens combine nicely, and as, if the chickens are as well spread out as they should be, they do not spoil the grass for pasture for the cows, to use the mowing land for pasture for cows and chickens after the first crop is off pays better than to attempt to secure a second cutting. Such, at any rate, is the testimony of many who have tried both ways.

There are many farms where a few acres of mowing land heavily manured with hen manure give a very abundant crop of hay each year; but I want to mention one in particular, where, largely through the use of hen manure (though it is a combined dairy and poultry farm), applied both by the fowls themselves and in bulk

by the farmers, the cut of grass has been enormously increased in a few years. When the present owner took this farm, of about 100 acres, some seven years ago, it would not cut one ton of hay. It had been a very much neglected if not literally an abandoned farm. Last year it cut forty tons of hay, and within a year or two, as additional portions of it are brought into a high state of productiveness, the farm will cut a hundred tons of hay per annum.

COMBINATION ALMOST INEVITABLE.

But grass, though a profitable crop, and made more profitable through the agency of the hens, is not a crop that can be used to any great extent as poultry food. Some clover rowen, cut in good season and nicely cured, the hens can use to good advantage; but it is hardly worth while to attempt to use for poultry food any but clover or alfalfa hay, and a small piece of ground will furnish enough of either of these for quite a large stock of poultry. So it becomes a question, to be decided by each farmer according to his circumstances, whether it will be more profitable for him to have as much as possible of the farm in grass, sell hay and buy grain, or to endeavor to grow as much as possible of the grain needed. Or, to put the question the opposite way and from a farmer's rather than from a poultry keeper's standpoint: supposing a farm a considerable part of which is suitable for grain growing, will it pay better to sell the grain, or to feed it to stock on the farm?

I think that it is to-day a commonly accepted principle in farming, that, to maintain or increase the crop-producing capacity of a farm, as much as possible of the produce must be fed on the farm, the nutritious portions converted into produce of small bulk and easily handled, and the residue returned as manure to feed the land. Assuming that a certain farm is to be conducted on this principle, the next question to be decided is: what kind or kinds of live stock shall be used in converting the bulky produce of the land into more condensed forms, of greater value and more easily handled?

There have been many farmers in this section who, when they became interested in poultry, and found it, perhaps, more profitable than anything else they had tried on their farms, gave all their attention to the poultry, to the neglect, if not to the entire abandonment, of every other branch of farm work. So far as my observation goes, such men have generally found it necessary to retrace their steps, and gradually get back to a combination in which some other branches of farm work were quite equally important with poultry. The reasons which bring them back to more diversified farming have already been stated. They are the same as those which

suggest to a poultryman who is not a farmer, after he has had experience in watching some of the leaks in an exclusive poultry business, the advisability of extending operations into side lines which will take care of those leakages, even if to do so requires some curtailment of the principal, or poultry, business. The farmer, because of his previous training, is likely to see and act more quickly in such cases than another man would.

When one branch of the work on a farm is proving more profitable than others, there is a temptation to develop it at the expense of the others. This, to be sure, is in the line of natural development, but even naturally things overdevelop sometimes; and in such cases we have to be careful to avoid developing a favored line of work so fast and so far that the change of conditions thus created reacts on the profits from this line of work. For such over-development not only means failure of income from the lines of work abandoned, but it means that there will soon be a reduction of profit, as compared with cost and labor, in the overdone branch itself. By overdoing one branch, that balance of interests, the proper adjustment of which means the maximum of profit from the minimum of investment and labor, is disturbed.

Two ILLUSTRATIONS.

Returning to the question of the poultry farmer's growing his grain, or the grain-growing farmer feeding his grain to poultry, I want to tell a little about two farms which I have visited within a few months, visiting them within a few days of each other, which furnish excellent illustrations of the matter under consideration, one from the farmer's, the other from the poultryman's, point of view.

The first is a farm of 200 acres, in New York State. For a number of years this farm was run by its present owner and a brother as a grain and grass farm, and was run at a loss. In the effort to make the farm pay, they took up Holstein cattle, and after a few years began to find the balances on the ledger going to the right side. At some time during the early experience in making a stock farm the other brother withdrew, leaving the one who still owns it in full control. Becoming interested in poultry and finding it profitable, this man built up a large poultry plant, and increased the poultry stock until last winter he had at the beginning of the season about 3,000 laying hens. The poultry plant has been some six years or more in developing, and in that time the stock of cattle has been very much reduced; it has, indeed, been reduced too much; and the owner of the farm told me that, while he considered it more profitable to feed his grain to the

fowls than to sell it or use it in any other way, he had found that to use his farm and all its produce to best advantage he would have to carry a larger herd of cattle and some sheep, which, with the horses needed for the farm work, would use a part of the grain, and what hay, straw and pasturage could not otherwise be used to full advantage. It may interest those who read this to know that, though this man paid for his farm with Holsteins, he is now going into Guernseys.

The other farm alluded to is located in New Jersey, and contains about 100 acres of good land, practically all under cultivation. This farm has for many years been owned by a city business man, and until last year was occupied by a tenant farmer. A son of the owner of the farm has within a few years built up on the farm quite a large and profitable poultry plant, following at first the intensive method a little more closely than is advisable on a farm, and using but a small portion of the land for poultry. But as the poultry business grew, the need of abundance of room for the growing stock and the advantages of combining poultry keeping and the growing of crops which could be used for poultry food became so apparent that when recently the tenant's lease expired, it was not renewed, and the owners are now operating the entire farm themselves, hiring competent farm hands to attend to the crops, the poultry being still the special charge of the young man who built up the poultry plant.

These two farms (I wish every reader of this bulletin could see them both) furnish the most noteworthy illustrations of combined poultry keeping and crop growing I can at present call to mind, though I could cite scores of cases where similar combinations are made on a smaller scale.

The point is to strike the proper balance between the different kinds of work and make them fit well together.

THE LABOR QUESTION.

The most difficult matter to regulate, when poultry keeping is combined with other farm lines of work, is the labor. When the pressure of work in two or three different lines is greatest at one season of the year, something is likely to be neglected. As a rule, the branch of work neglected is that which seems of least importance, or in which the worker feels less certain of his ability to get the results desired. Thus, an expert poultryman, trying to do some farming, who finds that he cannot handle all the work he has undertaken, usually neglects the farming; while a farmer is more apt to make sure of the crops, to the neglect of the poultry. Now, I do not feel that I am at all competent to tell any one who gets into

such a predicament how to handle the crops to get as much as possible out of them with the least possible expenditure of labor; but I can point out some ways for lightening the burden of poultry work. What I have to say will not, perhaps, be of much immediate value to one involved in a tangle of overwork. It is more in the way of telling how to keep out than how to get out of such difficulties. The key to the problem is found in the right combination of common farm methods and intensive methods of poultry keeping. By the farm method, the hens come very near taking care of themselves; by the intensive method, the hens do almost nothing for themselves,—all depends upon the keeper. By striking the golden mean between the two extreme methods, a farmer is able to handle a flock of poultry large enough to consume and profitably convert into eggs and meat a considerable part of his farm produce, and to handle such a flock without allowing that work and farming proper to interfere. Three things will be found of prime importance in bringing about this result: the hens must be kept in larger flocks than is usual with the intensive method, they must be given more yard room, and the system of feeding must be such that feeding will take as little time as possible.

It has long been taught by authorities on intensive methods of poultry culture that the best results in eggs were obtained from small flocks, and that, for some unknown reason, hens would not lay well when kept together in large numbers. As a result of this kind of teaching, it has been and still is the practice, almost general among those who make special efforts to make poultry profitable, to divide the stock into small lots, containing from 12 to 25 or 30 hens each, the smaller number being regarded as more desirable for actual results, though, because of the increased cost of housing and yarding, a little larger flock is said to be, on the whole, more profitable. I cannot, within the limits allowed this article, present a mass of facts bearing on this subject, which facts would show positively, by the experience of many different poultry keepers, that the keeping of hens in large flocks is not necessarily a bar to good egg production. A little further on I will mention two cases in point. For the rest of the evidence I must ask the reader to take my word for it that laying hens can be kept in large flocks and yet lay as well, so far as can be ascertained, as they would lay under any circumstances. There are particular reasons for not keeping breeding stock in large flocks, but these have nothing to do with the number of eggs produced. It is true that the greater number of poultry keepers get better egg yields from small flocks than from larger ones; it is also true that some poultrymen get as good egg yields from large flocks as are obtained from small ones,

except in very exceptional cases. What investigations and observations I have been able to make have convinced me that the general reason for poor results from large flocks is underfeeding. Certain it is that all those I know (altogether there are a good many of them) who get good results from large flocks are liberal feeders, — almost extravagantly liberal, quite a number of them keeping food by the hens all the time.

Much less time is required to care for 200 hens in two flocks of 100 each than to care for the same number in flocks of 12 to 30 each. One of the most successful small poultry farmers I know keeps 600 to 700 hens in flocks of about 100 each, each lot occupying its own house, but all running in the same field. One of the men who is most successful in getting winter eggs keeps as high as 500 hens in a single flock, and in the same house. Such facts as these effectually disprove the theory that there is something in the nature of the hen which prevents good egg production from large flocks, and puts the responsibility where it belongs, — with the keeper. He must learn to get eggs from the large flocks if he wishes to work to best advantage. It is simply a question of feeding the large flock right, — of seeing that they get enough to eat.

Close confinement is irksome to most fowls. They fret under it, because their movements are too restricted. Hence fowls in close confinement, in small yards, require a great deal of attention, with special provision to keep them occupied and busy. Give the same fowls room enough, so that the restraints placed on them are not oppressive, and they are contented, keep healthy, and produce well without so much attention from the keeper.

An objection often made to large yards is the cost of fencing. This objection loses much of its force when applied to large flocks and large yards, for the larger the yard the lower the fence needed, and thus the relative cost of fencing is much less for hens in large than for hens in small flocks.

When hens have abundant room, feeding is a much easier matter than when they are closely confined. "Little and often" is the feeding rule of most intensive poultry keepers. Hens that have room in which to be contented, — room to roam about without coming to a fence every few steps, and perhaps opportunity to pick a small part of their living, can be fed, and fed right, by giving food only twice a day; and if it is necessary to do so, it is possible in such cases to arrange so that all the feeding can be done at one time, the soft food to be eaten at once and the grain through the day as the hens want it.

In feeding young chickens the same thing is true. With abun-

dance of room they require far less care. The best arrangements I have ever seen for growing young chicks have been on farms of breeders of choice exhibition fowls, who want to give their chicks the best possible chance to grow into fine specimens, and endeavor to aid nature in every possible way. I visited such a farm not long since, where the broods of chicks were distributed at good intervals along the edges of the mowing fields. The coops were placed out this way quite early in the spring, as fast as the chickens were hatched. The fences were lined with vines and shrubbery, making a fine shade for the chicks. Before the grass was ready to cut a narrow strip was mowed with a scythe along the edge near the coops, giving ample room for the chicks while small. Then after the hay crop was taken off the growing chickens had all the land to themselves. Such an arrangement as this is possible anywhere, and for ordinary stock it is possible to care for chicks in this way with very little work. Food and water can be by them all the time, and with opportunity and the disposition to exercise, with plenty of green stuff and bugs and worms to be had, I have seen chicks thus grown on cracked corn alone and with little labor.

PARTNERSHIP ARRANGEMENTS.

So far we have considered our subject on the supposition that one man has to do all the various tasks. When a man can have help from some members of his family, or when his business justifies the employment of another man, or when two or more men work together as partners, the problem is very much simplified, because it is easier for two or more persons to divide certain labors than for one person to divide his time for a variety of tasks or occupations. The ideal condition of diversified farming which includes poultry keeping is a partnership, in which each member of the firm or of the family looks after a particular branch of the work, and each helps out others in emergencies. It is not necessary to attempt an enumeration or specification of the possibilities of arrangements of this kind. Poultry keeping is an employment in which both women and children can engage to advantage, and at the same time it is one which, if conducted on a large scale, is worth a man's time and strength and resources.

Rightly managed, it will always, as far as we can now see, be a profitable specialty for most farmers in the area contiguous to our great sea-board cities. We can conceive of conditions under which the western farmers, with their facilities for producing poultry products abundantly and cheaply, might make poultry growing in the eastern States unprofitable; but we cannot find reasons for supposing that those conditions will ever materialize,

and if the eastern farmer will make good use of his opportunities and advantages, he need not fear western competition in poultry and eggs. The bulk of the best trade in the lines in which he can operate to best advantage will always be his own. The principal consideration with him should be to keep the cost down as low as is consistent with good quality, and to avoid leakages and losses of all kinds. The selling price takes care of itself. The cost price is more under control of the producer; and hundreds of producers to-day are finding that the best profit from poultry is derived from poultry keeping as a leading feature in diversified farming.

MASSACHUSETTS
CROP REPORT

FOR THE

MONTH OF SEPTEMBER, 1901.

ISSUED BY

J. W. STOCKWELL,
SECRETARY STATE BOARD OF AGRICULTURE.

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CROP REPORT FOR THE MONTH OF SEPTEMBER, 1901.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., Oct. 1, 1901.

Bulletin No. 5, Crop Report for the month of September, is herewith presented. We desire to call the particular attention of our readers to the article on "Irrigation in Humid Climates," by Prof. C. S. Phelps, agriculturist at the Storrs (Connecticut) Agricultural Experiment Station, which is printed at the close of the bulletin.

PROGRESS OF THE SEASON.

The September report of the statistician of the United States Department of Agriculture (Crop Reporter for September, 1901) gives the condition of corn on September 1 as 51.7. There was a decline during August amounting to 2.3 points, and the condition on the first of the month was 28.9 points lower than last year, 33.5 points lower than in 1899, 31 points below the mean of the September averages of the last ten years, and 8.3 points below the lowest September average ever before recorded.

The average condition at harvest of winter and spring wheat combined was 82.8, against 69.6 last year, 70.9 in 1899, and a ten-year average of 80.3.

The average condition of oats when harvested was 72.1, against 82.9 last year, 87.2 in 1899, and a ten-year average of 81.6.

The average condition of barley when harvested was 83.8, against 70.7 last year, 86.7 in 1899, and 83.1, the mean of the September averages of the last ten years.

The condition at harvest of winter and spring rye combined was 84.9, against 84.2 last year, and 86.4, the mean of the averages of the last ten years.

The average condition of buckwheat on September 1 was 90.9, as compared with 91.1 a month ago, 80.5, on September

1 of last year, 75.2 in 1899, and 85.3 the mean of the September averages of the last ten years.

Since August 1 the improvement in the condition of tobacco was general. Virginia, Tennessee, Maryland and Pennsylvania report conditions 1, 3, 9 and 10 points above their respective ten-year averages; in Kentucky the present condition and the ten-year average are equal, and in North Carolina, Ohio, Wisconsin and Missouri the conditions are, respectively, 12, 13, 23 and 49 points below such averages.

The average condition of potatoes on September 1 was 52.2 against 62.3 a month earlier, 80 on September 1 of last year, 86.3 in 1899, and 78.8, the mean of the September averages of the last ten years.

There was a general decline in the condition of sweet potatoes during the month.

The acreage of clover seed has been reduced considerably since last year and the condition is generally below the ten-year averages in the several States.

Of the five principal sugar-cane States Missouri alone reports an improvement in condition during August.

An improvement in the condition of rice during the month of August is reported in but two of the rice-growing States — Florida and Texas.

Five of the principal apple-growing States report an improvement in condition during August, but only three States — Indiana, Virginia and Kansas — report conditions above their ten-year averages.

In all but two of the principal peach-growing States a production exceeding the ten-year average is probable.

In all the States where the production of grapes is of more than local importance, except California, the condition is below that of last year, and below the ten-year averages.

There is a decrease in the number of stock hogs now being fattened, as compared with the number a year ago, in every State except Arizona.

The average condition of cotton on August 24 was 71.4, as compared with 77.2 on the 25th of the preceding month, 68.2 on Sept. 1, 1900, 68.5 in 1899, and a ten-year average of 74.9.

In Massachusetts the average condition of corn September 1 was given as 98; the average condition of rye when harvested as 92; the average condition of oats when harvested as 82; the average condition of barley when harvested as 83; the average condition of buckwheat September 1, as 97; the average condition of potatoes as 66; the average condition of apples as 39; the product of peaches compared with a full crop as 53; the average condition of grapes as 90; the average condition of tobacco as 100; the number of stock hogs compared with last year as 95, and their average condition as to size and weight as 99; the acreage of clover seed compared with last year as 103, and the condition of the crop as 97.

TEMPERATURE AND RAINFALL FOR THE WHOLE COUNTRY.

[FROM THE UNITED STATES CLIMATE AND CROP BULLETINS.]

Week ending September 2.—The week was slightly cooler than usual in portions of Virginia, Tennessee, Kentucky and in Florida. It was also cooler than usual in California and western Oregon. Elsewhere throughout the country the week was warmer than usual, the excess being greatest in the Rocky Mountain region, the lower Missouri valley, the lower Lake region and New England. Rain during the week was excessive in the greater portion of Virginia and the south Atlantic States. There was also heavy rain in the Lake Erie region. There was a deficiency in the Missouri and upper Mississippi valleys and New England, generally throughout the Rocky Mountain region and California.

Week ending September 9.—The week was slightly cooler than usual in the south Atlantic States and in portions of Alabama, Tennessee, Virginia and West Virginia. It was also cooler than usual in the Pacific Coast States and over the greater portion of the Plateau regions. The week averaged warmer than usual from Texas northward to the Dakotas and thence eastward to New England. There was an excess of rain in eastern Washington, Montana, southern portions of North Dakota, Minnesota, and Wisconsin, all of South Dakota and Nebraska, northern Iowa, western Kansas and Oklahoma. From the central portion of the great valleys eastward to the Atlantic coast there was very little rain.

Week ending September 16. — The week averaged warmer than usual over the greater part of the middle Pacific coast region, the south-eastern Rocky Mountain slope, West Gulf States, and generally in the districts to the east of the Mississippi River. From the Missouri and upper Mississippi valleys westward to the Pacific coast the week averaged cooler than usual. Very heavy rains fell during the week in the west Gulf States and generally throughout the central valleys and the Lake region, including the northern portion of the middle Atlantic States and New England. Along the Atlantic coast and over portions of the east Gulf States there was less than the average rainfall.

Week ending September 23. — The week was abnormally cool to the eastward of the Rocky Mountains, except in the immediate Atlantic coast districts. The week was also cooler than usual along the California coast and over portions of the central Plateau regions. On the north Pacific coast and in southern California the week averaged slightly warmer than usual. The weekly rainfall in the Gulf States, Tennessee, Carolinas, southern Virginia, and at some stations along the middle Atlantic and New England coasts exceeded the average. There was also more than the usual rainfall over portions of the central Missouri valley. In the west Gulf States, Ohio, the upper Missouri valleys, over the greater part of the Lake region and middle Atlantic States and in Florida the weekly rainfall was less than the average.

SPECIAL TELEGRAPHIC REPORTS.

[WEATHER BUREAU, BOSTON.]

Week ending September 2. — New England. Boston: Weather favorable; corn excellent, field corn being shocked, canning sweet corn commenced; potatoes in Aroostook County, Me., good, elsewhere light; second crop of grass heavy and well secured; peaches rotting badly in Connecticut; tobacco excellent, cutting commenced.

Week ending September 9. — New England. Boston: Weather favorable for harvesting; heavy crop rowen; Hungarian grass secured in excellent condition; corn excellent, cutting, canning and filling silos general; potatoes light, dig-

ging begun; apples poor, light crop; tobacco cutting general, good crop.

Week ending September 16. — New England. Boston: Weather seasonable; copious showers, beneficial to fields and pastures; harvesting general; corn good, excellent quality; apples poor, continue to drop; potatoes light to fair crop; tobacco nearly cut, good crop; fall feed good.

Week ending September 23. — New England. Boston: Weather, generally unfavorable for harvesting but favorable for pastures and fall feed; frosts in northern sections, little damage; potatoes yielding better than expected, some complaint of rot; cranberries in good condition, fair yield; tobacco maturing under favorable conditions.

THE WEATHER OF SEPTEMBER, 1901.

The weather of the month was uneventful, and, generally speaking, characteristic of the season. The first decade of the period was marked by fair weather, and mostly with abundant sunshine. Showers fell in many sections on the 11th and 12th, and these were succeeded by several pleasant days. A season of well-distributed showers prevailed from the 16th to the 21st, during which the major portion of the precipitation of the month occurred. Little rain fell during the remainder of the month, and there was an entire absence of rainfall from the 22d to the 28th inclusive. Owing to the seasonal condition of the soil there was, however, little complaint of the dry weather or unfavorable effects of the same on crops, and the conditions were most favorable to harvesting, to fall seeding, and out-door work. The temperature during the month was almost uniformly high, ranging from one to two degrees above the normal. The first cool weather occurred on the 20th and 21st, when light to moderate frosts were noted, which were the first of the season. Frosts also occurred on the 25th, but, with slight exceptions, they were too light to greatly damage vegetation. In coast sections and on high lands the frost was very light, and for the larger portion of the territory of this description none occurred. The winds of the month were mostly westerly, without special features or destructive force. Viewing the month as

a whole the weather was very pleasant, and it will go on record as one of the most agreeable of its name.

In the circular to correspondents returnable to us September 23 the following questions were asked:—

1. How does the crop of Indian corn compare with an average crop?
2. Are rowen and fall feed up to the usual average?
3. Has the usual amount of fall seeding been done, and what is its present condition?
4. How does the onion crop compare with a normal crop?
5. Are potatoes a normal crop in yield and quality?
6. What is the prospect for root crops, celery and other late market-garden crops?
7. How have the apple, pear, peach, grape and cranberry crops turned out?

Returns were received from 150 correspondents, from which the following summary has been made:—

INDIAN CORN.

The warm weather of early September ripened Indian corn in excellent condition, and the crop is one of the best ever secured. It is reported as well eared, and with a good growth of stover, which was secured in good, bright condition, and which should be of good nutritive value.

ROWEN AND FALL FEED.

An unusually good crop of rowen is reported in all sections. The rains of the second and third weeks of the month interfered with securing the crop and damaged that cut and in the field to a considerable extent, but otherwise the crop appears to be of good quality. Fall feed is also in excellent condition, and pastures and mowings should start another season in good condition.

FALL SEEDING.

Less than the usual amount of fall seeding has been done, as the rains made it difficult to prepare the land in many instances and also owing to the fact that farm work was generally somewhat behind at the beginning of the month. Many

correspondents state that much more will be done. That which is up is generally reported as looking well and giving good promise.

ONIONS.

Onions are reported as less than an average crop, especially in the chief onion-growing sections. Blight is not reported and they appear to be curing well. Prices are the highest for several years, and the net profits from the crop promise to be even greater than in some years of heavy yields.

POTATOES.

While potatoes are somewhat uneven the crop as a whole is considerably below the normal in yield. Rot is reported from almost all sections and in some cases is evidently making severe inroads on the crop. The tubers are also reported to be small and scabby, and the quality in general is not of the best.

ROOT CROPS, CELERY, ETC.

Root crops are generally reported to be in excellent condition and to promise well. Celery is also a good crop as far as reported on. Other late market-garden crops promise well in most instances.

FRUITS.

The yield of apples will be very light indeed, in fact not much, if any, over one-fourth of the average, and what few there are are certainly not of extra quality. Pears are generally a fair crop of good quality. While peaches are not by any means a full crop over the State they are perhaps very nearly up to the average of years. Grapes are generally a good crop and have ripened well. Fuller reports from the cranberry-growing sections than we have previously received lead us to believe that the crop is fully an average one. It is now mainly secured in good condition without damage from frosts.

NOTES OF CORRESPONDENTS.

[Returned to us September 23.]

BERKSHIRE COUNTY.

Alford (L. T. OSBORNE). — Indian corn is 10 per cent above the usual average. Rowen and fall feed are much better than the average, and the good condition of fall feed has been a great saving for fodder corn. Some fields of potatoes are very good and some very poor. Root crops, celery and other late market-garden crops promise average yields. Apples are not over 25 per cent of an average crop.

West Stockbridge (W. C. SPAULDING). — Indian corn is excellent both as to grain and fodder. Rowen and fall feed are very good indeed. Onions are not raised here. Potatoes are a fair crop, but rot is appearing to some extent. Apples scarce; pears good; peaches not much raised; grapes good; no cranberries.

Becket (W. M. H. SNOW). — Corn will be an average crop. Rowen and fall feed are fully an average. Not quite the usual amount of fall seeding has been done but it looks well. Not many onions raised here. Some fields of potatoes give a light yield and other fields a good yield, but rot has appeared on all fields. Root crops, celery and other late market-garden crops promise a good yield. Apples and cranberries very light crops; pears a large crop; few peaches raised. There has been difficulty in getting rowen and harvesting oats because of the wet weather.

Washington (E. H. EAMES). — The corn crop is better than for three or four years past. Rowen and fall feed are better than in former years. The usual amount of fall seeding has been done and it is in good condition. The potato crop is the largest for a number of years, but they are rotting very badly. Root crops, celery and other late market-garden crops are not much raised. There is about a one-third crop of apples, pears, peaches, grapes and cranberries.

Dalton (W. B. BARTON). — Indian corn is a full average crop. Rowen and fall feed are up to the usual average. Not much fall seeding has been done but what is in looks well. Potatoes are not

a normal crop in yield, are rotting badly and are scabby. The prospect for root crops, celery and other late market-garden crops is excellent. Apples few, pears good and peaches fair.

Hancock (C. H. WELLS). — Corn is a very good average crop. Rowen and fall feed are up to the usual average. No onions raised. Potatoes are a short crop in yield, with many small tubers and some rot. Root crops, celery and other late market-garden crops are little raised. Pears and grapes abundant; very light crop of apples; no peaches.

Cheshire (L. J. NORTHUP). — Indian corn compares favorably with an average crop. Rowen and fall feed are up to the average. Fall seeding is being done to quite an extent, but it is too early to judge as to its condition. Onions are a fair crop though little raised. Late potatoes would have been an average crop but for the rot. The prospect looks to be good for most root crops. Apples are very scarce, probably 90 per cent off from last year; some pears; grapes a good crop but none raised for market; cranberries not grown in this locality.

Savoy (W. W. BURNETT). — Corn is a full average crop. Rowen and fall feed are more than average crops. The usual amount of fall seeding has not been done, but more will be done later. Onions are not much raised. Potatoes are a fair crop but some fields are rotting badly. The prospect for root crops is fair; celery and other late market-garden crops are not much grown. Few apples; peaches seurfy; grapes not much grown.

Williamstown (S. A. HICKOX). — Frost has held off so that corn has matured and is a good average crop. Rowen was never better and fall feed is in good condition. Not as much fall seeding done as usual. Onions are a normal crop. Potatoes 60 per cent of a crop. Apples, 40 per cent; pears and peaches 60 per cent. The prospect for root crops, celery and other late market-garden crops is good.

FRANKLIN COUNTY.

Monroe (D. H. SHERMAN). — Indian corn is in very good condition. Rowen and fall feed are fully up to the average. But very little fall seeding has been done in this section. Potatoes are perhaps a three-fourths crop of fair quality, but are rotting very badly, some fields being half rotten. Turnips average; squashes are late and the very heavy frost of the 20th hit them hard. Very few apples and pears; some grapes; cranberries good as far as raised.

Rowe (J. F. BROWN). — Corn is fully an average crop. Rowen and fall feed are above the average. Fall seeding is about the

same as usual in amount, and is in fine, No. 1 condition. Potatoes are about an average crop, of nice quality. Root crops promise to be above the average. The apple crop is a failure, being less than one-fifth of the normal; pears, peaches, grapes and cranberries are not raised to any extent.

Bernardston (R. H. CUSHMAN).—There is a full average crop of Indian corn. The rowen crop is unusually large and pasture feed is prime. Much seeding is done in the corn crop and it is at present in fine condition. Potatoes are a light crop, of good quality. Vine crops have been very light. Cabbages are not heading well. There are very light crops of all kinds of fruit.

Gill (F. F. STOUGHTON).—Indian corn is better than an average crop. Rowen and fall feed are better than the usual average, but farmers do not pasture their mowings as much as they used to. Potatoes will be a poor crop. Root crops, celery and other late market-garden crops are not much raised for market. Apples few; pears good; grapes few.

Ashfield (CHAS. HOWES).—Corn is fully an average crop. There is a heavy growth of rowen and much of it has not been cut. About the usual amount of fall seeding has been done and it is looking finely. Potatoes are a light crop and are rotting badly, quality otherwise very good. The prospect for root crops, celery and other late market-garden crops is good. Pears have been plenty; apples and other fruits very light. The month of September has been good for growing crops but bad for harvesting.

Whately (FRANK DICKINSON).—Indian corn is not over three-fourths of an average crop. Rowen and fall feed are up to the usual average. Less than the usual amount of fall seeding has been done but it is in fair condition. Onions are less than a normal crop and there are many small ones. Early potatoes were a poor crop; late varieties a fair yield, some rot. No apples; pears fair; peaches good; few grapes.

Sunderland (J. M. J. LEGATE).—Indian corn is above the average and is generally very heavily eared. Rowen and fall feed are above the average, in fact I never saw them in better condition. The usual amount of fall seeding has been done and it is looking finely. Onions are below the average in size, but the total yield for the town is probably fully up to the average as the acreage has been increased this year. Not enough root crops, celery and other late market-garden crops are raised to make any account of. Apples, pears and grapes light; peaches are said to be a good crop.

Montague (C. S. RAYMOND).—Indian corn is just about an average crop. Rowen and fall feed are a little better than an average, though a little later than usual. About the usual amount

of fall seeding has been done and is in good condition. Onions are rather less than an average crop. Potatoes are not over 60 per cent of a full crop, quality fair. Root crops, celery and other late market-garden crops promise about average yields. Apples are a very light crop; pears heavy; grapes a light crop; no cranberries grown.

Wendell (N. D. PLUMB). — Indian corn is about a normal crop. Rowen and fall feed are the best for years. But very little fall seeding has been done as yet. Potatoes are about a one-fourth crop of good quality. Root crops, celery and other late market-garden crops are but very little raised. Apples are about a failure; pears good, but the peach crop is a failure, and cranberries are about a normal crop.

HAMPSHIRE COUNTY.

Prescott (W. F. WENDERMUTH). — Corn is a full average crop. Rowen is a full crop and fall feed is 10 per cent above the average in condition. No onions grown for market. Potatoes are about 25 per cent off in yield and are rotting badly. Cattle beets and turnips are good crops; no market-garden crops or celery grown. Apples are about 20 per cent of a full crop; pears a full crop; peaches very few; grapes good, full crop; no cranberries grown.

Greenwich (Wm. S. DOUGLAS). — Indian corn is a very good crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done. Potatoes are less than a normal crop in yield and are decaying. The prospect for root crops, celery and other late market-garden crops is very good. There are very few apples.

Belchertown (H. C. WEST). — Indian corn is 25 per cent above an average crop, the best crop for years. There is a full average rowen crop and fall feed is in good condition. The usual amount of fall seeding has been done, but there is much complaint that it has not come up well. Potatoes are a light crop and are rotting in many places. The prospect for root crops, celery and other late market-garden crops is very fair. Apples are half a crop or less; pears good; peaches fair. Much rain and cloudy weather is good for the growth of roots and grasses, but bad for harvesting late rowen, millet, Hungarian grass, etc.

Hadley (H. C. RUSSELL). — Corn is better than an average crop. Rowen and fall feed are up to the usual average. Onions are a three-fourths crop, but are bringing extra good prices. Potatoes are a light yield with some rot. The prospect for root crops, celery and late market-garden crops is fair. The apple crop will

not be sufficient to supply the home demand, but there is a fair crop of peaches.

Southampton (C. B. LYMAN). — The corn crop is fully up to the average. Rowen is very good and fall feed is better than the average. Some fall seeding has been done, but much remains to be done. Onions are not as good a crop as usual and have not ripened well. Potatoes are very uneven, a few good fields and many light ones, with many complaints of rot. Late market-garden crops are not up to the average. Apples very few; pears, peaches and grapes very good crops.

Westhampton (H. A. PARSONS). — Indian corn is a full crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and it is in good condition. Onions are not raised. Half the potatoes have rotted. The prospect is good for root crops, celery and other late market-garden crops. Apples are a one-third crop; some grapes.

Chesterfield (HORATIO BISBEE). — Corn is a good crop, fully up to the average. Frequent rains have kept feed good and produced a good rowen crop. I have not noticed as much seeding as usual, perhaps on account of farmers being a little behind with their work. The potato crop is very uneven, some having a good crop while other fields are almost a failure, and much rot is reported after harvesting. Apples are a very light crop; other fruits not much raised.

Goshen (ALVAN BARRUS). — Indian corn is late and rather below the average. Rowen and fall feed are fully up to the average. The usual amount of fall seeding has been done. Very few potatoes were raised and those few are hardly up to the average. Root crops, celery and other late market-garden crops promise to be about average. Apples very light and poor; pears good; no peaches; grapes medium but late; cranberries good. The season has been very wet for harvesting and help is scarce.

HAMPDEN COUNTY.

Tolland (E. M. MOORE). — Indian corn will be a good average crop. Rowen and fall feed are more than average crops. Potatoes are yielding fairly well but are mostly decayed, so that the yield is of little use. Root crops, such as turnips, will be average crops. Apples are a failure; there are some pears; grapes and cranberries are plenty.

Granville (JOSEPH WELCH). — Corn is a very good crop but rather late. The rowen crop is the best we have ever had. Onions are not raised as a market crop. Potatoes are the poorest crop in

years and not over 25 per cent of normal yield. We do not raise root crops to any extent, except potatoes and turnips. The apple crop is a failure, but there are very good crops of pears, peaches, grapes and cranberries.

Russell (E. D. PARKS).—Indian corn is up to the usual average. Rowen is a very good crop, above an average in this vicinity. The usual amount of fall seeding has been done. Onions are but little raised. Potatoes are a small crop and many report rot. The prospect for root crops, celery and other late market-garden crops is very good. Pears good, all other fruits very poor.

West Springfield (T. A. ROGERS).—Indian corn is a three-fourths crop. Rowen and fall feed are above the usual average. There is hardly the average amount of fall seeding done and much remains to be done. Onions are a three-fourths crop. Potatoes are below the normal in yield and are rotting badly. Root crops are below the average; cabbage below the average; celery looking well by virtue of continual spraying. No apples to speak of; pears plenty; peaches a full average; some grapes. The weather has been so rainy that it has hurt nearly all crops and delayed the cutting of rowen.

Ludlow (C. B. BENNETT).—Indian corn is better than an average crop. Rowen and fall feed are above the usual average. About the usual amount of fall seeding has been done and it is in first class condition. Potatoes are not over half a crop. Apples are very light; pears fair; grapes light. Stock looks well and the flow of milk has kept up with very little grain feed.

Longmeadow (W. F. EMERSON).—Corn fodder is well grown and well eared, but not always in as sound or good condition as usual. There is much summer grass, but it is bulk without body. The usual amount of fall seeding has been done and it is in fine condition. Onions are little raised. Potatoes are less than a normal crop with some rot. Root crops, celery and other late market-garden crops are not much raised. Apples are few, small, poor and knurly; pears good; peaches never so plenty; grapes few.

Wilbraham (F. E. CLARK).—Indian corn is a full average crop although about two weeks later than usual. Rowen and fall feed are fully up to the average, as we have had an extraordinarily wet season. Potatoes are a very light crop, although very late planted fields are much better. Cabbages have done well. Apples are a small crop; pears a fair crop; peaches a full crop, but owing to a very damp ripening season have rotted very badly.

Palmer (O. P. ALLEN).—Indian corn compares favorably with an average crop. Rowen and fall feed are up to the usual average. Onions are less than an average crop. The quality of the potato

crop is good but the yield is far less than usual. The prospect for root crops, celery and other late market-garden crops is fair. The crop of pears and peaches is good, but apples, grapes and cranberries are far below the average.

Holland (FRANCIS WIGHT).—Indian corn is more than an average crop about here. The rowen crop and fall feed are above the average. The usual amount of fall seeding has been done and it is in good condition. Onions are not more than an average crop. Potatoes are not over a two-thirds crop and of poor quality. Root crops are fair; celery not much raised. Apples poor; pears good; peaches light and grapes and cranberries fair.

WORCESTER COUNTY.

Warren (W. E. PATRICK).—Indian corn is a full average crop. Rowen and fall feed are rather above the usual average. On account of the recent rains there has not been as much fall seeding as usual, but it is in good condition. There is less than a normal yield of potatoes of fair quality, but with considerable rot in many fields. The prospect for late market-garden crops is good. There are no apples of any account; a fair crop of pears, peaches and grapes.

Spencer (H. H. KINGSBURY).—We have a magnificent corn crop; ten per cent above the average. Rowen and fall feed are very abundant, but it has been a difficult task to cure rowen or millet. There has been no fall seeding done this season in this vicinity. There is general complaint of a scant yield of merchantable potatoes, but the quality is very good. The present condition of root crops is such that it is safe to predict a good crop of turnips, cabbages and celery. There has been a large crop of pears, an average crop of cranberries, a light crop of apples.

Rutland (L. S. DUDLEY).—Indian corn is about an average crop. Rowen and fall feed are above the average. Less than the usual amount of fall seeding has been done, but it is in good condition. Potatoes are a light crop and are rotting somewhat. The prospect for root crops, celery and other late market-garden crops is good. No apples; plenty of pears and grapes.

Oakham (JESSE ALLEN).—Indian corn is a full average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and it is in excellent condition. Potatoes are about half a crop of inferior quality. Onions are not raised. The prospect for root crops, celery and other late market-garden crops is fair. No apples or cranberries; pears and grapes abundant; very few peaches.

Barre (J. L. SMITH).—Corn is more than an average crop. Rowen and fall feed are very much above the average. The usual amount of fall seeding has been done and it is in fine condition. Onions are not raised. Potatoes are a light yield and are rotting considerably. No apples to speak of; other fruits not raised to any extent.

Dana (E. A. ALBEE).—Indian corn is a full average crop. Rowen and fall feed are fully up to the usual average. Onions are not raised here. Potatoes are about three-fourths of a normal crop. Root crops, celery and other late market-garden crops promise good average yields. No apples; pears average; no peaches; grapes normal; not many cranberries.

Gardner (A. F. JOHNSON).—Indian corn is more than an average crop. Rowen and fall feed are better than usual. Potatoes are about an average crop of fair quality, but some rot has appeared. Root crops are doing well. There will be no apples to speak of in this vicinity.

Westminster (G. A. STOCKWELL).—Indian corn is not up to the standard. There will be a good crop of rowen and fall feed is in fair condition. Potatoes are not a normal crop. Root crops are doing fairly well. Fruit of all kinds is a light crop with the exception of pears.

Princeton (A. O. TYLER).—Indian corn is in very good condition. Rowen and fall feed are up to the usual average. About the usual amount of fall seeding has been done and it is in good condition. Onions are a good crop. Potatoes are not a normal crop in either yield or quality. Root crops, celery and other late market-garden crops are raised very little in this vicinity. There are hardly any apples; pears good; peaches, grapes, and cranberries small crops.

Lancaster (S. C. DAMON).—Indian corn is an average crop. Rowen and fall feed are up to the usual average and better. Some fall seeding has been done and there is still more to do. Onions are not over three-fourths of an average crop. Potatoes are much less than a normal crop in yield and are rotting on some fields. Root crops, celery and other late market-garden crops are in good condition. Apples are 10 per cent of a normal yield; pears 75 per cent; peaches 50 per cent; grapes and cranberries 100 per cent.

Holden (G. S. GRAHAM).—Corn is a good average crop. Rowen and fall feed are more than average crops. Fall seeding looks finely and the usual amount has been done. Potatoes are about an average crop in yield but are rotting badly. Most root crops are looking well. Very few apples, the least for years; pears, grapes and cranberries fair but not large.

Worcester (H. R. KINNEY). — Indian corn seems to be fully up to the average. Rowen and fall feed are up to the usual average. Onions seem late and rather light. The potato crop is very uneven, some fields heavy and others light; quality medium. Root crops are late as a rule and carrots have blighted badly. There are very few apples and those of poor quality; pears good and plenty; peaches much better than the average; grapes a very light yield; cranberries not grown here; plums set for a full crop, but the wet weather has rotted many of them; all fruit seems to sell readily.

Oxford (D. M. HOWE). — Corn is an average crop. Rowen and fall feed are fully up to the usual average. Potatoes are not an average crop and are bringing a dollar a bushel. The prospect for root crops, celery and other late market-garden crops is good. Apples are a light crop; pears a full crop; peaches poor; grapes and cranberries plenty. Everything is growing in this section and looks beautifully, as we have had plenty of rain.

Douglas (J. M. RAWSON). — More corn was planted than usual and the crop is an extra good one. The rowen crop and fall feed are better than for several years past. About the usual amount of fall seeding has been done but it is not far enough advanced to determine its condition. Onions are a medium crop. There is complaint that potatoes are rotting and are scabby; some fields are very light and will not pay for digging while others give good crops. No apples; pears few; no peaches; grapes few and cranberries very light.

Blackstone (O. F. FULLER). — There will be an average crop of Indian corn. More rowen is being cut this season than for two or three years past. Fall seeding is in good condition on account of the large amount of rain. Onions are not much raised. Potatoes are of good quality and a fair yield, but are rotting badly. The prospect for late root and market-garden crops is good. Very few apples; a fair crop of peaches and pears; a good crop of grapes; and an extra large yield of cranberries.

MIDDLESEX COUNTY.

Hopkinton (W. V. THOMPSON). — Indian corn is more than an average crop. Rowen and fall feed are more than up to the usual average. The usual amount of fall seeding has been done and it is in good condition. Potatoes are not a normal crop in yield and quality. Turnips and cabbages are looking well. Apples are a failure; pears a fair crop; peaches a poor crop; grapes a light crop; cranberries good.

Sherborn (N. B. DOUGLAS). — Corn is much better than an

average crop. Rowen is fairly good and fall feed beats the record in condition. Fall seeding is only partly completed and most of it is not up yet. Potatoes are not a good crop in either yield or quality. Apples a one-fourth crop; pears half a crop; peaches and grapes three-fourths crops.

Framingham (J. S. WILLIAMS).—Notwithstanding its rapid growth corn will not compare favorably with an average crop in this section. The rowen crop is above the average. Onions generally blighted and ripened off under size. The quality of the potato crop is very good and the yield an average one. Celery is not much grown, but parsnips, carrots, beets, turnips, cabbages and peppers are looking well. No apples to mention; pears, peaches and grapes good paying crops. Squashes are a very light crop. Tomatoes have been a profitable crop in this section.

Stow (G. W. BRADLEY).—Indian corn is about the same as in former years. Rowen and fall feed are better than for a number of years. About the usual amount of fall seeding has been done and most of it is looking well. Not as many onions were raised as usual, but they are of good quality. The yield of potatoes was not as heavy as usual and there is considerable complaint of scab and rot. Root crops, celery and other late market-garden crops are not raised to any extent. Apples are of poor quality and dropping badly; other fruits quite plenty and good.

Townsend (G. A. WILDER).—Indian corn is about the same as usual. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and it is in normal condition. Onions are 25 per cent less than a normal crop. Potatoes are a normal crop with the quality above the average. The prospect for root crops, celery and other late market-garden crops is above the average. Apples, peaches and cranberries are less than average crops; pears average; grapes above average.

Dunstable (A. J. GILSON).—Indian corn is better than an average crop. Rowen and fall feed are above the usual average. But little fall seeding has been done, but that which is in is in good condition. The onion crop is very light. The potato crop is very uneven and as a whole below a normal crop; in quality they are very good. The root crop is very good; not enough celery and other late market-garden crops to make mention of. Apples are a light crop; pears light; no peaches; grapes a normal crop; cranberries very light.

Chelmsford (P. P. PERHAM).—Indian corn is a good average crop. The rowen crop is a very large one and fall feed is above the average. The onion crop is better than normal both in quantity and quality. Potatoes are much below an average crop and of very

poor quality and late ones are rotting badly. The prospect for root crops is good; celery and other late market-garden crops a good average. The apple crop is a total failure; pears plenty; grapes and cranberries an average crop.

Carlisle (E. J. CARR).—Corn is a little less than an average crop. Rowen and fall feed are above the average. Onions are below a normal crop. Potatoes are a light crop with some rot. The prospect for root crops, celery and other late market-garden crops is good. There is a small crop of all kinds of fruit.

Lincoln (C. S. WHEELER).—Indian corn is an average crop. Rowen and fall feed are up to the usual average. Onions very little raised. Potatoes are a three-fourths crop of fair quality. The prospect for root crops, celery and other late market-garden crops is fair. Apples and peaches are very short crops; pears and grapes fair; not many cranberries.

Woburn (W. H. BARTLETT).—What little Indian corn is raised is a very good crop. Rowen and fall feed are above the usual average and rowen has been put into the barn in good condition. About the usual amount of fall seeding has been done and it is in good condition. Onions are a very fair but not an extra crop. Potatoes are under sized and somewhat seabby and not a full yield. The prospect for root crops, celery and other late market-garden crops is very good except for squashes and cucumbers.

Stoneham (J. E. WILEY).—Corn is a fair average crop. Rowen and fall feed are up to the usual average. Very few onions are raised. Potatoes are a normal crop in both yield and quality. The prospect for root crops, celery and other late market-garden crops is good. Apples are a poor crop; pears, peaches and grapes good.

Newton (OTIS PETTEE).—Indian corn is rather better than an average crop. There is a full crop of rowen and fall feed is plenty. Onions have yielded fairly well. The potato crop is about the same as in other years. Pears are plenty; but few peaches grown, quality good.

ESSEX COUNTY.

Salisbury (WESLEY PETTENGILL).—Corn is better than an average crop. Rowen and fall feed are up to the usual average. About the usual amount of fall seeding has been done and is looking well. Onions are not much raised but are about an average crop. Potatoes are rather a light crop of good quality, but with some rot. What root crops, celery and other late market-garden crops there are are looking well. Apples are very light; pears fair; peaches rather light; grapes good; cranberries fair. Cab-

bages look well but are quite wormy. Squashes are a light crop, the vines dying badly in the summer.

Amesbury (F. W. SARGENT). — Indian corn is an average crop. There has been an unusual amount of rowen harvested. Onions are a three-fourths crop. Potatoes are a light crop of poor quality, and rotted on some fields. Roots promise fairly well but celery is a poor crop. There are scarcely any winter apples; pears plenty and grapes the same.

Haverhill (EBEN WEBSTER). — Corn is rather more than an average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done. Onions are less than a normal crop. Potatoes have made a fair yield, but there is some rot on late fields. Apples light; pears medium; no peaches; grapes fair.

Groveland (ABEL STICKNEY). — Corn is more than an average crop. There is a large crop of rowen and fall feed is plentiful. The usual amount of fall seeding has been done and more will be done, that which was in early is looking finely. Potatoes are a normal crop of fine quality. The prospect is generally good for root crops, celery and other late market-garden crops. Apples very few; pears plenty; some peaches; grapes a fair crop.

Ipswich (O. C. SMITH). — Indian corn is more than an average crop. Rowen and fall feed are generally above the average. Not as much fall seeding as usual has been done, but what new fields have been laid down are doing well. Onions are not as good a crop as usual. Potato vines grew large, but the crop is 40 per cent below the average. Late market-garden crops are not much raised for sale but gardens are generally giving good crops of all vegetables. Apples very poor; pears small; grapes normal; cranberries good.

Wenham (N. P. PERKINS). — Not much corn is raised except for fodder and the silo. There is a good crop of rowen on well manured land and a fair amount of fall feed. Fall seeding is rather backward and there is some yet to be done. The onion crop varies, some fields yield fairly well and others are quite light. Potatoes are rather a light yield of fair quality. Not much celery raised; carrots hardly up to the average; cabbages and parsnips quite good. Apples very short; pears good; no peaches; grapes and cranberries not much of a crop. Tomatoes have been a good crop, but prices are quite low. Squashes are nearly a failure.

NORFOLK COUNTY.

Canton (E. V. KINSLEY). — Indian corn is a good average crop. Rowen and fall feed are above average crops. Fall seeding is

backward, but what has been done looks well. No onions raised. Potatoes are a good average crop, but are rotting generally. The prospect for root crops, celery and other late market-garden crops is good. There are almost no apples, but other fruits mentioned are very good.

Norwood (F. A. FALES). — Corn is about a three-fourths crop, having suffered from excessive rains. There is more rowen here than for a number of years and pastures are in good condition. Onions are about 80 per cent of a normal yield, but are of poor quality. Potatoes are not more than half a crop; they blighted badly, are rotting some and wire worms are eating many. Root crops, celery and other late market-garden crops are poor and will not be over half crops. Very few apples, pears and peaches; fair crop of grapes, and about 40 per cent of a crop of cranberries.

Medway (MONROE MORSE). — Indian corn is a fair average crop. Rowen and fall feed are somewhat above the usual average. About the usual amount of fall seeding has been done and it is in good condition. The yield per acre of potatoes is generally light and the tubers very irregular in shape. Apples not more than 5 per cent of a full crop; pears, peaches and grapes full crops.

Franklin (C. M. ALLEN). — Indian corn is more than an average crop. Rowen and fall feed are the best for years. But very few onions are raised. Potatoes are a three-fourths yield of good quality. Root crops, celery and other late market-garden crops promise to be more than average crops. Apples few; pears poor; peaches good; grapes light and cranberries half a crop.

Norfolk (G. E. HOLBROOK). — Indian corn is a full average crop and ensilage corn a heavy crop. There is more than an average crop of rowen, but the weather has been very poor for curing it. A large area of fall seeding has been put in and it is in very good condition. Onions are not up to an average crop. Only a small amount of root crops, celery and other late market-garden crops are raised here. Apples poor; other fruits good crops.

BRISTOL COUNTY.

Mansfield (W. M. C. WINTER). — Indian corn is 10 or 15 per cent above an average crop. Rowen and fall feed are both above the average in condition. Onions are little grown. Potatoes are a normal crop of good quality. Root crops, celery and other late market-garden crops, with perhaps the exception of squashes, are in excellent condition. Apples poor; pears fair; no peaches; grapes poor.

Attleborough (ISAAC ALGER). — Indian corn is a full average crop. Rowen and fall feed are up to the usual average. The

usual amount of fall seeding has been done and it is in good condition. Potatoes are not a normal crop in yield or quality. Root crops, celery and other late market-garden crops promise very well. There are no apples which are good for anything. Cranberries are below the average in quantity, but above the average in quality.

Raynham (N. W. SHAW). — Corn is fully equal to an average crop. Rowen and fall feed are above the usual average. Less than the usual amount of fall seeding has been done. Potatoes are not a normal crop in either yield or quality. Root crops, celery and other late market-garden crops are in good condition; no apples; pears good; no peaches; grapes and cranberries average.

Dighton (J. N. PAUL). — Indian corn is more than an average crop. Rowen and fall feed are not up to the usual average. The usual amount of fall seeding has been done and it is in good condition. Onions are less than a full crop but are of good quality. Potatoes are not a normal crop in yield or quality. The prospect is good for root crops, celery and other late market-garden crops. Apples, pears, peaches and grapes poor; cranberries not grown. Strawberry plants look well but the acreage for another year is smaller than usual.

Westport (A. S. SHERMAN). — Corn is not up to the average. Rowen and fall feed are fully up to the usual average. Onions are an average crop. Potatoes are not a normal crop in yield or quality. Turnips and cabbages promise very well. Apples and cranberries are less than average crops; pears, peaches and grapes very plenty.

Acushnet (M. S. DOUGLAS). — Corn is an average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, but it is not up to expectations on account of drought. Onions are not an average crop. Potatoes are about half a crop of good quality. The prospect for root crops, celery and other late market-garden crops is good. Few apples and peaches; pears and grapes plenty; cranberries a fair crop.

PLYMOUTH COUNTY.

Hanover (H. L. HOUSE). — Indian corn is above an average crop. Rowen and fall feed are above the usual average. The usual amount of fall seeding has been done and it is in good condition. Onions are fully an average crop. Potatoes are of large size and good quality. Root crops, celery and other late market-garden crops promise well. Apples are a short crop; pears, peaches, grapes and cranberries good.

Marshfield (J. H. BOURNE). — Corn is a little better than an average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, but it has not grown well owing to recent dry weather. Onions are less than an average crop. A few fields of potatoes yield well, others not half a crop. The prospect for root crops, celery and other late market-garden crops is good if rain comes abundantly. Cranberries, grapes, pears and peaches are good crops; no apples.

Pembroke (NATHANIEL MORTON). — Indian corn is an average crop. Rowen and fall feed are far in excess of the usual average. Onions are a normal crop. Potatoes are not a normal crop in yield or quality. The prospect for root crops, celery and other late market-garden crops is good. No apples; pears fair; no peaches; grapes fair; cranberries a two-thirds crop.

Halifax (G. W. HAYWARD). — Corn has been late but we shall have a good crop. There is more rowen and fall feed than for many years. About the usual amount of fall seeding has been done and it looks fairly well. Onions are not more than half a crop. Turnips are a fair crop and other root crops are in good condition. There is not much fruit except pears and cranberries, which are quite plenty.

Wareham (A. B. SAVARY). — There is an average crop of corn. Rowen and fall feed are above the usual average. Very little fall seeding has been done. Onions are a good crop. The yield of potatoes is small but the quality is good. The prospect for root crops, celery and other late market-garden crops is good. No apples; other fruits fair crops.

Mattapoisett (E. C. STETSON). — Indian corn is a little better than an average crop. Rowen and fall feed are a little better than the usual average. About the usual amount of fall seeding has been done and it is looking well. Onions are not much raised but are looking well. Potatoes are a very poor crop, both in yield and quality. Root crops, celery and other late market-garden crops are in quite good condition. No apples to speak of, pears and grapes very good; a large crop of cranberries.

BARNSTABLE COUNTY.

Bourne (D. D. NYE). — Indian corn is a good average crop. Rowen and fall feed are not up to the usual average. The usual amount of fall seeding has been done and it is in fair condition. Onions are not raised. Potatoes are about half a normal crop. Beets, turnips and cabbages look well. No apples; pears very good; no peaches; a few grapes. The cranberry crop is very good, in some localities better than last year, in others not as good.

Mashpee (W. F. HAMMOND). — Indian corn is more than an average crop. Rowen and fall feed are about average crops. The onion crop is below the average. Potatoes are below the average in yield and are inclined to rot. Late market-garden crops promise to be above the average. Apples, pears, peaches, grapes and cranberries half crops.

Barnstable (JOHN BURSLEY). — Corn is 10 per cent off in condition. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done, but that put in late suffered for rain. Onions are an average crop. Potatoes are an average crop in yield and quality. French turnips suffered during September for rain; few other root crops grown. Apples very light; pears heavy; peaches and grapes fine. The cranberry crop is very heavy and two-thirds of the crop has been harvested in very good order.

Chatham (E. Z. RYDER.) — Corn is less than an average crop. The rowen crop is almost worthless and fall feed is in very poor condition. Less than the usual amount of fall seeding has been done and it is in poor condition. Onions are a small crop of small size. Late potatoes were less than an average crop. Root crops, celery and other late market-garden crops are not up to the average owing to lack of rain. Apples a medium crop; pears about average; grapes a little below average; cranberries a little less than an average crop.

Eastham (J. A. CLARK). — Rowen and fall feed are in very good condition. Potatoes are a good crop in both yield and quality. Root crops, celery and other late market-garden crops are looking well. Cranberries are a fair crop; no apples.

Wellfleet (E. S. JACOBS). — Indian corn compares favorably with an average crop. Rowen and fall feed were damaged somewhat by rain as they are mostly on low land. Fall seeding is good and promises to continue so for some time. There are very few onions raised. Late potatoes are very good and above the average in quality. The prospect is good for all root crops, and especially good for celery. Apples are a failure, none of any amount; grapes are plentiful and cranberries far above the average.

NANTUCKET COUNTY.

Nantucket (WALLACE GARDNER). — Indian corn is quite up to the usual average. Rowen and fall feed are better by one-half than the usual average. Onions are not at all a good crop. Potatoes are generally a short crop. Turnips and mangolds are good crops, and celery and other late market-garden crops promise well. The cranberry crop is very good.

BULLETIN OF
MASSACHUSETTS BOARD OF AGRICULTURE.

IRRIGATION IN HUMID CLIMATES.

By Prof. C. S. PHELPS, *Storrs (Connecticut) Agricultural Experiment Station.*

While irrigation is not a new subject, its importance in those parts of the United States where the climate is naturally humid has not been fully appreciated. In European countries, even where the rainfall is quite large, the advantages of irrigation are better known. In the older countries of the world, where the population is relatively dense and the value of lands is consequently high, every possible means that will aid in assuring full crops must be adopted. For one hundred years or more irrigation has been practised in the naturally moist climates of Italy, Scotland and England. The methods of artificial watering used in the old world gradually found a place in New England, and to-day many traces of old irrigation ditches may be found, especially where small streams could be easily diverted and a natural flowage be obtained. Several plain evidences of such irrigation systems, on old farms in Connecticut, have come under the observation of the writer. Most of these systems have been abandoned; in many cases because the farms were abandoned and in others because the streams did not continue to give sufficient flow when irrigation was most needed. Within the last ten years there has been a new interest in irrigation and a lively agitation of the subject through the agricultural press of the east, and small fruit and vegetable growers are beginning to appreciate the value of artificial watering to a greater extent than ever before. Its high value has been demonstrated in a few striking instances by some of our leading fruit growers, and these instances, together with the general interest manifested in the subject, have led to much inquiry regarding methods of irrigation adapted to the east.

In a limited discussion of so large a subject it may be best at the outset to state briefly the reasons why irrigation is important to the New England farmer and then to enlarge upon the different points in their order. These reasons are as follows: (1) The uneven distribution of the rainfall and the occurrence of frequent, severe droughts during the growing season; (2) the large amount of water used by all crops, and especially by most crops of high market value; (3) the large amount of water lost to the plant by leaching and by evaporation from the soil; (4) the high value per acre of many of the crops best adapted to New England; (5) the high price of lands and the changed conditions of agriculture; (6) the many small streams and ponds by means of which irrigation may be made practicable at small expense.

Probably the first reason why farmers do not as a rule appreciate that irrigation has any place in New England agriculture is on account of our heavy rainfall. The average yearly rainfall (including melted snow) for Massachusetts is about 45 inches. This amount of water is ample for the needs of nearly all crops when it is fairly evenly distributed throughout the year. But the precipitation is very unevenly distributed; much of it falls as snow in winter or as rain during the spring and fall months. Short, severe, summer droughts are a characteristic of this climate. A high temperature, accompanied by drying winds, will, in a week's time, frequently cause our crops to wilt, and in less than three weeks the crop prospects may be nearly ruined as a result of the absence of the water needed to keep up a vigorous growth.

In order to make a good growth most crops need, during the three summer months, a rainfall of from 3 to 4 inches, and this needs to be fairly evenly distributed throughout these months. During the past thirteen years the Storrs Experiment Station has had rainfall records taken in about a dozen different places in Connecticut, and these, with others made under the direction of the New England Meteorological Society, show pretty accurately the average amount of rainfall for the summer months.

Rainfall in Connecticut during the Summer Months, 1888-1900.

YEAR.	June.	July.	August.	No. of Stations.
1888,	Inches. 1.69	Inches. 2.05	Inches. 5.30	18
1889,	3.83	11.35*	3.92	20
1890,	2.96	4.29	4.29	17

* Omitted in averaging.

Rainfall in Connecticut during the Summer Months, 1888-1900
— Concluded.

YEAR.	June.	July.	August.	No. of Stations.
	Inches.	Inches.	Inches.	
1891,	2.47	4.24	3.81	20
1892,	2.65	3.80	4.35	26
1893,	2.65	2.12	4.69	22
1894,75	1.55	1.81	23
1895,	2.74	4.36	4.54	21
1896,	1.78	3.22	2.71	20
1897,	2.79	12.24*	5.23	21
1898,	2.48	6.24	5.87	21
1899,	3.72	5.55	3.27	21
1900,	4.32	2.76	2.03	23
Average,	2.68	3.65	3.99	—

* Omitted in averaging.

From these records it will be seen that the average rainfall during thirteen seasons for June is only 2.68 inches, for July (omitting two years of excessive rainfall) it is 3.65 inches, and for August practically 4 inches. The interesting point to be considered is that the month of June, during which most of the small fruits and many vegetables make a large part of their growth, is generally deficient in rainfall.

There are very few seasons during some part of which a drought of more or less severity does not occur. With crops like strawberries, raspberries, early potatoes and onions a lack of rain for two or three weeks may lessen the crop one-half or more. A striking illustration of the injury caused by short droughts was seen in the season of 1895, on one of the farms in Connecticut, where irrigation was being put into operation for the first time. A field of strawberries that had been set out in the spring of 1894 was on too high ground to be reached by water conducted from the storage pond. A field of the same size on another part of the farm was sprinkled from pipes laid on the surface. The irrigated area, with only three applications of water, gave a yield two and two-thirds times greater than that obtained on the area which could not be irrigated. As a more recent illustration, which nearly every farmer will recall, we would point to the light hay crop occasioned by the spring and early summer drought of 1899, and again in 1900. In contrast to this, we can note the large hay crop of the present season, occasioned mainly by the heavy rainfall of May and the early part of June.

In reference to the second reason it may be well to point out,

first, that all growing plants are made up largely of water. Green grass or clover contains from 80 to 90 per cent of water. Many of our common fruits, such as strawberries, raspberries, peaches and pears contain from 80 to 92 per cent of water. The importance of this to the farmer is seen in the fact that when he sells such crops he is mainly disposing of water and a small amount of mineral salts. As one prominent fruit grower puts it, he sells in his fruit barrels of water with a little flavoring extract in it. The water held in the tissues of the plant, however, represents but a small part of the total amount needed by the plant; a very large amount is evaporated or transpired through the foliage during the period of growth.

It has been estimated that a crop of hay at two tons per acre, or about six and one-half tons of fresh grass, will evaporate during its season of growth about 525 tons of water; that an average crop of wheat, of 720 pounds of grain and 1,500 pounds of straw to the acre, will evaporate about 260 tons of water, or, in other words, according to these estimates, every ton of green grass evaporates through its foliage during the period of growth about 81 tons of water, and in drying this ton of grass loses about two-thirds of its weight, so that one-third of a ton of hay (667 pounds) utilizes in its growth about 81 tons of water. An inch of rainfall is equal to 113 tons of water per acre. The above figures indicate that the water evaporated by an acre of grass ($6\frac{1}{2}$ tons) would equal about 4.6 inches. In some cases this amount of water is more than the total rainfall during the period of time in which the crop makes its growth. These figures, of course, only represent averages. In very moist times evaporation would be checked and in dry times it would be increased. In other words, at times when the plant uses water most rapidly there is the least available amount from the rainfall.

Professor King of Wisconsin has shown that the amount of water transpired through the foliage and evaporated from the soil by some of our common crops is as follows, when estimated on the basis of dry matter in the crop:—

- Dent corn per ton of dry matter, 2.64 inches of water.
- Flint corn per ton of dry matter, 2.14 inches of water.
- Red clover per ton of dry matter, 4.03 inches of water.
- Oats per ton of dry matter, 4.76 inches of water.
- Potatoes per ton of dry matter, 4.73 inches of water.

If we assume a fair yield of red clover to be 10 tons per acre (green) with 25 per cent of dry matter (equal to $2\frac{1}{2}$ tons per acre), the clover crop would use about 10 inches of water in its growth.

An acre of dent corn yielding 15 tons green, with 25 per cent dry matter (equal to $3\frac{3}{4}$ tons), would use during its period of growth 10.6 inches of water. As shown in the table of rainfall previously given the average rainfall for the past fourteen years from about twenty localities in Connecticut for the months of June, July and August is only 11.3 inches.

Of course, no account is made here of water lost by leaching. The one important lesson that these results do point out is the large amount of water used in the growth of plants and the need of conserving the stores in the soil, or of adding an artificial supply when the rainfall is below the average. We know of no extensive experiments showing the amount of water used by small fruits, but all crops which produce a heavy growth of foliage transpire moisture rapidly. A crop like strawberries, which makes a heavy growth of both foliage and fruit in about two months, must use immense quantities of water.

The discussion of the large amounts of water used by plants naturally leads to the consideration of the losses of moisture from the soil. Only a part of the water which falls becomes available to growing crops. A considerable part flows off on the surface of the ground and finds its way into streams, while in the case of heavy rains quite a portion is leached away and carried beyond the roots of plants. However, in soils that are not too porous much of the water which is leached into the lower strata may find its way back to the surface soil by capillary attraction. One of the most important matters to be considered in the culture of crops is that a large and variable quantity of water is evaporated directly from the soil. The amount of this depends upon several conditions, the chief of which are the state of the weather, the kind of crop on the soil, the amount of cultivation, and whether or not the soil is mulched. In times when rainfall is insufficient for the best growth of crops the atmospheric conditions are usually such as to favor the evaporation of moisture from the soil. The amount of evaporation that takes place depends upon the amount of wind that may be blowing over the soil and the degree of saturation of the air. Meteorological data showing the relative humidity of the air indicate that on hot, dry days the air may contain as low as from 20 to 50 per cent of its water-holding capacity. Under such conditions, especially in connection with winds, the moisture evaporates from the soil very rapidly. The shade afforded by crops like grass and small grains tends to lessen the amount of evaporation from the soil, while crops which do not shade the ground as much furnish conditions more favorable for the escape of moisture.

It is a well-known fact that mulch, in the form of coarse hay, straw, etc., tends to prevent the escape of moisture. This, together with the cleaner fruit that is thus obtained, is one of the reasons for using such materials on strawberry fields. Frequent stirring of the surface soil by cultivation has much the same effect in preventing the escape of moisture as the direct use of mulch. In the experiments by the writer, on the evaporation of moisture from heavy loam and from light loam soils, the soils in a part of each series were frequently stirred at the surface, while the others were not stirred. The average loss of moisture from the light loam soil, not stirred, was equal to $1\frac{1}{3}$ inches, while the average loss from the stirred soil was $\frac{3}{4}$ of an inch. This means that, in a given time, nearly twice as much water was evaporated from the soil left in a naturally compact condition as where the surface was mulched by frequent stirring.

A strong argument in favor of irrigation in Connecticut is found in the high value per acre of many farm and garden crops. The following table shows the range of value per acre for some small fruits and market-garden crops, as given by practical farmers, when these crops have not been irrigated:—

Strawberries,	\$200 to \$450
Raspberries,	200 to 400
Asparagus,	100 to 200
Cauliflower,	200 to 400
Celery,	200 to 300
Onions,	150 to 300

It will readily be seen that a loss of one-half on the value of some of these crops, when five or six acres are grown, would cover quite an outlay for water. Two men in Connecticut who have made extensive use of irrigation state that the cost of their irrigation plants was returned the first season by the increased crops obtained where water was applied.

With crops like strawberries and raspberries the benefits derived from irrigation represent only a few weeks' labor and a small expenditure of money. So great is the gain derived from having an abundance of water for these crops, at the right time, that good profits have been obtained by the use of a road engine and force pump. In many places this form of power could be hired for a few days and large profits be obtained from its use.

Before farming products were shipped by rail long distances the prices obtained for the crop in any locality depended largely upon the supply in that immediate vicinity. If the season was not a favorable one for any particular crop, and the yields were light,

the increased prices obtained often counterbalanced the deficiency in the yield. To-day, however, if there is a shortage in any crop in one locality the market, except in the case of perishable products, may be stocked from long distances away, where the weather conditions were perhaps favorable for large yields. The profits obtained by local growers are thus largely dependent on the season, and it frequently happens that the season of poor crops, resulting from lack of rainfall, nearly or quite uses up the profits of favorable seasons.

The high price of lands in New England, especially in the vicinity of cities and towns, makes it important that relatively large profits be obtained from crops in order to cover taxes and interest. The high price of lands together with the changed demands of our markets have caused a complete transformation in the methods and in the leading branches of farming. The intensive system of cultivation, where market-garden crops and fruits take the lead, has almost entirely replaced the older or extensive system, where the staple crops, like the cereals, were in the lead. The high value of lands where truck and fruit crops are grown, together with the high value of such crops when grown, points out the need of some form of protection against drought. Many fruit growers have adopted spraying as an insurance against damage by fungus diseases and insects, and in the same way irrigation may be considered as an insurance against drought which often pays good dividends.

The sixth reason why irrigation should be more generally used in New England is the natural condition of the country which favors its adoption. New England is an area of uneven surface, cut by many small rivers which are bordered by fertile valleys. Into these valleys flow numerous small streams which make a rapid descent. In many instances these streams can be diverted and carried along the sides of the valley in such a way as to flood several acres at very little cost. In other cases natural ponds can be tapped or small dams can be constructed and the water from the ponds thus formed be used. In cases where it becomes necessary to lift the water large-sized rams may be used if sufficient fall for forcing the ram can be obtained.

SOME INSTANCES OF SUCCESSFUL IRRIGATION.

In the year 1895 the writer made a special study of irrigation in Connecticut and will give a brief description of some of the most successful plants found in operation. The oldest irrigation plant in Connecticut, which is still in operation, is probably located on the farm of Joseph Albiston at South Manchester. The privilege was granted in 1796, the water being taken from a small stream at a

point about 60 rods above the limits of the farm. There are two small irrigation plants now in use on this farm. In the older one the water is conveyed in an open ditch and about five acres are watered from it. This plant was for many years used in irrigating grass, and fine crops of hay were obtained. During the past twenty years Mr. Albiston has used it mainly for watering small fruits and vegetables. Of the area watered from this canal about three acres are nearly level, having a fall of less than 5 feet in 400 feet. The water can be conveyed by means of a branch ditch along one end of this area and then, as needed, turned down between the rows of small fruits and vegetables. About one acre, on quite a steep slope just below the main ditch, is thoroughly watered by seepage, the water percolating through the soil a few feet below the surface for a distance of about 4 rods from the main ditch. A second plan of irrigation on this farm was put in operation a few years ago. Near where the brook enters the farm a small dam was constructed and a pond formed. The water from this pond was used in watering about two acres of bottom land on the opposite side of the brook from the area watered from the main ditch. Most of the irrigated area consists of a gravelly loam, but the two acres of bottom land are a compact loam with a hard-pan subsoil. This area has been underdrained, and the surplus water used in irrigating is conveyed off in these drains.

Mr. Albiston has found the use of irrigation especially profitable on strawberries. Since he has irrigated this crop he rarely fails to obtain large yields, while before irrigation was employed he says partial failures from drought were common. In 1894, 32 square rods of land planted with Crescent strawberries produced at the rate of 10,400 quarts per acre. In 1895, with a very severe drought in strawberry time, Mr. Albiston claims that his crop was the best he ever produced. The Black-cap raspberries and black-berries have each year produced exceptionally fine crops by the aid of irrigation. Potatoes have been irrigated during seasons of drought. In 1894, which was a very unfavorable season for potatoes, the crop obtained by the aid of irrigation yielded at the rate of 300 bushels to the acre. Mr. Albiston is especially fortunate in being able to irrigate on quite an extended scale at a very small cost. Under conditions of this kind irrigation must pay a very fine profit.

The Hale Brothers of South Glastonbury, extensive growers of fruits and of nursery stock, have adopted one of the most extensive systems of irrigation to be found in New England. It differs from the system just described by having the water conveyed in iron pipes for a distance of nearly one mile. A small brook, which

has never been known to go dry, was dammed and a reservoir thus formed. The source of the water is about 100 feet above the fields to be irrigated. Heavy iron pipes, 6 inches in diameter, were used for 360 feet from the reservoir, then a 4-inch pipe for 1,900 feet, until a fall of 50 feet was obtained, after which the pipe used was only three inches in diameter. The line of pipe was carried along the tops of the ridges of the farm, and at points about 200 feet apart hydrants were placed, so that water can be taken from the main pipe and be used for surface flowage or for sprinkling. It has been estimated that there is sufficient water to irrigate forty to fifty acres, mainly by surface flowage. The contour of the land and the character of the soil are such that the water can be distributed between the rows of plants so as to give a very even distribution. Mr. Hale has used the water mainly on nursery plants and trees, upon small fruits, and, to a limited extent, upon peach trees which were producing fruit. Mr. Hale is of the opinion that the use of water on peach trees will prove profitable, during the fruiting time, in seasons of severe drought.

Another typical system where pipe for conducting the water is used is found on the farm of W. A. Leigh of Thomaston, Conn. This system is described because of the peculiar method used in distributing the water on the irrigated area. The farm is located in a narrow valley at the base of a cliff, which rises, quite abruptly, some 300 feet above the fields which are irrigated. Over this cliff pours a small stream which is fed by springs near the top. By building a dam across a narrow ravine a storage pond covering several acres was formed. The water is conducted through a 3-inch pipe laid on the surface of the ground, and is used for furnishing power for a small granite works as well as for irrigating. The pressure is so great — about 125 pounds to the square inch — that a small stream runs a water-wheel furnishing seven horse-power. The water is used for irrigating purposes at night. Branch lines of pipe of $1\frac{1}{2}$ and of 1 inch in diameter are laid on the surface of the ground some 50 feet apart. Short pieces of hose are attached to these lines of pipe once in about 50 feet, and the water is applied by spraying through $\frac{3}{8}$ -inch nozzles. The pressure is so great that three or four of these $\frac{3}{8}$ -inch streams may be kept "playing" from a single line of pipe at the same time. The water is forced to a great height and spreads over quite an area, like a heavy shower of rain. While Mr. Leigh has about eighteen acres upon which irrigation might be applied, its use has been confined to a few acres of strawberries. Beginning in 1887, he has irrigated this crop every year since. In 1895 about three acres were under irrigation. The water is applied about the time the plants

bloom, and is continued till near the end of the fruiting season if needed.

J. C. Eddy of Simsbury, Conn., is making a specialty of small fruits and vegetables, and severe droughts, which have been quite frequent, have caused much damage to his crops. The farm is located near the western limits of the Connecticut valley, and is composed mainly of a light, porous, rather sandy soil, that requires large quantities of water to grow crops successfully. A small stream, within a narrow valley, passes through the farm, and the tillage lands lie mainly upon the slopes outside this valley. As the brook was below most of the cultivated fields some form of pumping appliance seemed to be the only feasible means of making the water available, and a ram was adopted as the most practical. For the first two or three years only one large ram was used, but the advantages of irrigation became so apparent that another of equal capacity was added. In order to get the necessary fall for forcing the ram a canal about 40 rods in length was dug along the outer edge of the valley. From the lower end of this canal the water makes a fall of about 7 feet, through 6-inch drive pipes, and thus operates the two large rams located near the centre of the valley.

At quite an elevation above the cultivated fields, on a heavy, clayey soil, was a small pond that usually became dry in summer. This pond was enlarged by dredging and by building an earth dam on two sides. A storage pond was thus formed with an area of about one-half acre and with an average depth of about 4 feet. This pond is located about 80 rods from the ram and at a height of 70 feet above it, and there is a good fall from the pond to most of the cultivated areas. Connections can be made with the pipe leading from the ram, at various points between the ram and the storage pond, and the direct flow of water can thus be used for irrigating certain areas.

Most of the irrigated fields on this farm are watered from lines of pipe extending from the storage pond. The fall from the pond is sufficient so that strawberries have been watered by sprinkling from 2-inch condemned fire hose, a flow of about 30 gallons per minute being obtained in this way. A more common method of distributing the water has been to use a series of troughs along one end of the rows of crops. The water was conducted into these by means of gates, and was allowed to flow down between the rows in little rills.

Mr. Eddy has made a specialty of strawberries, generally growing from four to six acres. The first year after his irrigation plant

was installed he had two areas on high ground which he could not irrigate and two acres on lower ground to which pipes were laid for conducting the water. Early in June a drought began, which seriously injured the strawberry crop all over the State. At the end of the season it was found that the two acres which were not irrigated had yielded 150 crates (32 quarts each), while the two acres which were irrigated yielded 415 crates. After the first few days picking the fruit on the non-irrigated fields was much smaller and darker colored and soon after shrivelled. The quality of this fruit was so much poorer than that on the irrigated area that it had to be sold for several cents per quart less.

Until within a few years, since the blight became so destructive, Mr. Eddy has been very successful in growing muskmelons by aid of irrigation. This crop has frequently been sold as high as \$350 to \$400 per acre. Asparagus and onions have also been grown with great success where water was applied. Cauliflower of excellent quality has been grown on this farm. This crop is one which responds readily to the use of water, and Mr. Eddy has irrigated it as often as once in five or six days when the rainfall was deficient. The crop has generally been grown on a medium heavy loam soil where the surface fall was only about 4 feet in 100 lengthwise of the rows. The water was allowed to flow down between the rows from a series of troughs at one end. With so slight a fall the flow was very gradual and the water would gradually soak laterally underneath the rows. The cauliflower headed earlier than usual where irrigation was practised, and the crop has generally sold for about \$400 per acre.

EXPERIMENTS WITH IRRIGATION ON STRAWBERRIES.

In June, 1895, the Storrs Agricultural Experiment Station began some experiments on the farm of Mr. Eddy, for the purpose of studying the effects of irrigation on the quantity and quality of strawberries, and to ascertain some facts regarding the profits to be obtained from the use of irrigation. A section of about two acres was chosen from a field of strawberries. The soil appeared to be nearly uniform, and the conditions were favorable for applying the water. The field had been set to strawberries in the spring of 1894. The Haverland was the variety used, with every fourth plant in the row a Jessie, the latter being used for fertilizing. The plots were laid out 115 feet long and 12 feet wide, three rows to a plot, two plots being irrigated and two not. Two rows were left between plots, which were not included in the experiment, in order to thoroughly separate the irrigated from the

non-irrigated sections. The plots were to be irrigated as often as seemed necessary to get good commercial results.

Comparative Yields in Quarts on Irrigated and Non-irrigated Plots of Strawberries, 1895.

PLOT 1, IRRIGATED.

PLOT 2, NON-IRRIGATED.

PLOT 3, IRRIGATED.

PLOT 4, NON-IRRIGATED.

The yield on the two irrigated plots was at the rate of 5,318 quarts per acre, and on the two non-irrigated, at the rate of 2,083 quarts.

Water was used on the irrigated plots on June 10, 15, 18 and 20. The water was applied by means of 2-inch hose from a $2\frac{1}{2}$ -inch iron pipe laid on the surface of the ground. The size of the stream and the force of the water was sufficient to give thirty gallons (about one barrel) per minute. At this rate of flow one man could sprinkle about one acre per day. The ground was given a thorough wetting each time.

On June 24 the writer visited the fields and made the following notes: "Plants on non-irrigated plots are drying badly. Leaves shrivelled, and many dry and dead. Fruit small, dark colored when ripe, and shrivelled and seedy. Fruit looks over-ripe when picked. The darker color is probably due to the increased sunlight that the fruit gets, owing to the shrivelled condition of the plants.

"Plants on the irrigated plots look fresh and vigorous; fruit large and abundant; much green fruit continuing to develop. Size of berries large, color bright. Fruit not quite as sweet as on the non-irrigated plots. Should judge the fruit from irrigated plots would sell for two to three cents per quart more than that from non-irrigated."

Mr. Eddy found that the fruit from the non-irrigated plots had to be sold for an average of nine cents per quart, while that from the irrigated areas brought eleven cents. At these rates per quart the fruit on the irrigated plots sold at the rate of \$584.76 per acre and that on the non-irrigated at the rate of \$187.47 per acre, a difference of \$397.29 per acre in favor of irrigation.

It will be readily seen that even with two acres of strawberries the increased returns obtained by the use of water would furnish quite a sum towards covering the expense of an irrigation plant.

SUGGESTIONS REGARDING IRRIGATION.

The contour of most of the land of New England is such as to readily admit of the conveyance and application of water for irrigation. Streams, ponds and springs are common, and, except in cases of severe droughts, furnish an adequate supply of water. Many crops, like strawberries, raspberries and early vegetables, need irrigating, if at all, early in the season, when the supply of water is often sufficient, while, perhaps, later in the season it would not be. Much of the land that would be improved by irrigation is in valleys, near to streams and ponds, which in many cases are high enough to give a moderate flow on the areas below, so the cost of getting the water would be merely nominal. The soils used for many of our most profitable crops are generally light and porous and leach water readily, but are just the kind of soils that most need irrigating; while our best money crops, such as small fruits and vegetables, are heavy users of water. There is no need of drainage, in connection with irrigation, on soils of this class, as is often the case where the surface soil is compact.

Means of making Water Available. — The sources of water for irrigation in New England are natural or artificial ponds, streams and springs, and in some cases wells. In many cases ponds are so located that water can be conveyed from them to fields on lower ground by means of open ditches, the expense depending upon the distance and the character of the ground to be passed through. This often is the cheapest method for securing water. When the supply is large the loss of water occasioned by soakage from the ditch or evaporation is not of serious consequence. The fall of many of our small streams is so great that by building a small dam the water may be turned from its natural course and conveyed in ditches along the outer edge of the valley and then allowed to flow over the surface of the fields back to the natural stream.

Rams. — In many places the source of supply is below the fields to be irrigated and the water can only be made available by some pumping device. The cheapest sources of power are water and wind, although steam or electricity may be profitably used where the water is wanted only for a short period of time. A ram, under many conditions, is the best power. As only a small part of the water that is needed to operate the ram can be pumped, the supply must be quite large and the ram of heavy capacity. If the water is lifted over 40 or 50 feet high the strain on the ram is quite

severe and all the parts must be securely and strongly made. But few styles of rams manufactured in this country are powerful enough to supply water for anything but small areas (four to eight acres).

Windmills. — If wind is the form of power to be used the mill should be constructed of the best materials, and be strong and secure in all its parts. Cheap forms of mills should be avoided in all cases. The best steel mills are the cheapest in the end. The mill should be located on high ground, so it will "catch" the wind from all directions and so that the place of storage may be sufficiently above the fields to be irrigated to give a good fall. The average velocity of the wind in New England is about twelve miles per hour. A 14-foot wheel will do good work with a wind of ten to fifteen miles per hour. Of course the movement of the wind is very irregular, but there is usually sufficient to furnish power for pumping water for three to six acres, by having a large storage tank. Wheels of large diameter are to be preferred in order to utilize light breezes.

Steam Power. — When water is wanted for a short time on one or two crops which generally give good profits, some form of engine and pump may be economically used. The Wisconsin Experiment Station has watered a variety of crops in this way and has shown this method of irrigation to be a profitable one. For crops like strawberries, raspberries and some vegetables which give large returns per acre and require water only for short periods of time, steam may be advantageously used as a source of power for pumping. On many farms a portable engine might be profitably rented for a few weeks during the strawberry season. This is a time when farm engines are seldom wanted for other purposes. Naphtha or gasoline engines of five to six horse-power are economical of fuel, can be easily operated, are of lighter weight than coal engines, and as a source of power they are worthy of careful consideration.

Application of Water. — The oldest method of distributing the water over the fields to be irrigated is by means of small ditches. These can be made by turning a furrow with a plow along the highest part of the field to be watered. By having a number of lines of these ditches parallel to each other along the slopes of the land the water may be let out on the lower side of the highest ditch and distributed over the land between this and the next ditch, while the second ditch will catch the surplus water. A man with a hoe removes obstructions and directs the water by opening small water courses. With a little attention the water can be made to touch nearly all parts of the field.

For crops like strawberries, when the water must be run between the rows, these should extend up and down the slope. Only a slight slope is needed to give free movement to the water; from 3 to 6 feet for every 100 feet is better than a greater fall. With a heavy fall, and especially if the soil is sandy, serious washing will often result. In case mulch is used on strawberries it is found to interfere badly with the flow when the water is applied by surface flowage. If mulch is thought to be necessary to keep the fruit clean, water should be applied freely just before the picking season begins, and then the mulch be applied. Wooden troughs may be used for distributing the water. These are made of rough boards 10 and 12 inches wide, nailed together v-shaped, and are supported on stakes across the upper ends of the rows in such a way as to give a slight fall across the field. By means of small auger holes the water can be made to flow out between the rows. With small strips of tin, gates are made over these holes so that the amount of flow can be regulated.

If the water supply is limited, iron pipes may advantageously be used in distributing the water to the points where needed. The water may either be allowed to flow from these over the surface or be applied by sprinkling. Unless the fall is very great (100 feet or more) these pipes should be at least 2 inches in diameter. Condemned fire hose 2 to 3 inches in diameter can be bought in most of our large cities, and if the fall from the reservoir or tank is 50 feet or more a heavy spray can be obtained by their use. A flow of twenty-five to forty gallons per minute seems to be necessary in using iron pipes and hose, in order to apply the water as rapidly as is desirable for strawberries.

In case a fall of 200 to 300 feet can be obtained, and the water can be conducted in pipes, it may be applied by means of lines of perforated pipes laid on wires over the fields. Or if the pipe is laid beneath the ground a series of small nozzles may be placed at intervals along the lines of pipe and the water be applied in the form of a spray.

MASSACHUSETTS CROP REPORT

FOR THE

MONTH OF OCTOBER, 1901.

ISSUED BY

J. W. STOCKWELL,
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CROP REPORT FOR THE MONTH OF OCTOBER, 1901.

OFFICE OF STATE BOARD OF AGRICULTURE,
BOSTON, MASS., NOV. 1, 1901.

Bulletin No. 6, Crop Report for the month of October, is herewith presented as the final issue of the season. We wish to again thank our correspondents for the assistance they have so freely and faithfully given us, and to solicit the continuance of their assistance another spring, if this work is continued, as we have every reason to believe it will be.

The special articles printed this season have been: Bulletin No. 1, "Three common orchard scales," by Prof. H. T. Fernald; Bulletin No. 2, "A lesson in economics: what the agriculture of the twentieth century demands," by Dr. G. M. Twitchell; Bulletin No. 3, "Selection and improvement of dairy herd," by Prof. F. S. Cooley; Bulletin No. 4, "Poultry keeping as a principal feature of diversified farming," by John H. Robinson; and Bulletin No. 5, "Irrigation in humid climates," by Prof. C. S. Phelps. Particular attention is called to the article on "Cranberry culture in south-eastern Massachusetts," by John Bursley, member of the State Board of Agriculture, representing the Barnstable County Agricultural Society, which will be found printed at the close of the bulletin.

PROGRESS OF THE SEASON.

The October report of the statistician of the United States Department of Agriculture (Crop Reporter for October, 1901) gives the average condition of corn on October 1 as 52.1, as compared with 51.7 a month earlier, 78.2 on the corresponding date last year, 82.7 in 1899, and 81.8, the mean of the October averages of the last ten years. This is the lowest October average ever recorded, the lowest heretofore being 64.2, on Oct. 1, 1894.

The preliminary estimate of the yield per acre of oats was 25.1 bushels, as compared with 29.6 bushels last year, 30.7

bushels in 1899, and 27.2 bushels, the mean of the October estimates of the last ten years. The average for quality was 83.7, against 89.2 last year and 89.5 in 1899.

Of the principal oat-producing States, only Ohio and Minnesota report a yield per acre in excess of their ten-year averages.

The preliminary estimate of the yield per acre of barley was 24.7 bushels, as compared with 20.4 bushels last year, 27 bushels in 1899, and 23.4 bushels, the mean of the October estimates of the last ten years. The average for quality was 89.2, against 82.1 last year and 88.4 in 1899.

The preliminary estimate of the yield per acre of rye was 15.1 bushels, as compared with 15.1 bushels last year, 14.4 bushels in 1899, and 14.3 bushels, the mean of the October averages of the last ten years. The average for quality was 89.4, against 92 last year and 90 in 1899.

The average condition of buckwheat was 90.5 as compared with 90.9 a month earlier, 72.8 last year, 70.2 in 1899, and 80.5, the mean of the October averages of the last ten years.

The average condition of potatoes was 54, as compared with 52.2 a month previous, 74.4 last year, 81.7 in 1899, and 75.4, the mean of the October averages of the last ten years. This is the lowest October condition on record.

Sweet potatoes are on the whole somewhat below the ten-year average in condition.

The condition of sugar cane approximates very near the ten-year average in the producing States, with the exception of Texas, where it is 15 points below.

Rice is generally somewhat above the ten-year average in the producing States.

As to the condition of apples, Indiana reports 2, Virginia 7, North Carolina 4, and Kansas 18 points above, and New York 37, Ohio 11, Pennsylvania 30, Michigan 23, Missouri 1, Illinois 27, Tennessee 2, Maine 11, and Iowa 32 points below the means of their October averages for the last six years.

The average condition of cotton on September 25 was reported to have been 61.4, as compared with 71.4 on August 24, 67 on Oct. 1, 1900, 62.4 at the corresponding date in

1899, and 70.3, the mean of the October averages of the last ten years.

In Massachusetts the average condition of corn October 1 was given as 99; the average yield of oats as 31, and the average quality as 85; the average yield of barley as 23.5, and the average quality as 94; the average yield of rye as 15.9, and the average quality as 93; the average condition of buckwheat as 93; the average condition of tobacco as 102; the average condition of potatoes as 67; and the average condition of apples as 31.

MASSACHUSETTS WEATHER, 1901.

[COMPILED FROM DATA FURNISHED BY THE NEW ENGLAND WEATHER SERVICE.]

During January there was about the usual amount of cloudiness and sunshine, and the number of stormy days was about the usual average. The average precipitation, 2.02 inches, was about an inch below the average, but, as it was well distributed throughout the month and over the territory, the deficiency was unimportant. There were no severe or destructive storms. The monthly temperature was about normal and quite even through the month. The snowfall was less than average, but the ground was generally covered through the month.

February was exceptionally pleasant. During 15 days of the month the skies were cloudless, and there was an average of only 6 cloudy days. The precipitation of the month was remarkably light, being but .88 of an inch. The snowfall was light, averaging about 10 inches, but much of it remained on the ground until the close of the month. The temperature formed a conspicuous feature of the month, it being uniformly low, with the monthly average about 3° below the normal. Notwithstanding the low monthly mean, there were no unusual ranges in the maxima and minima of the month.

March was also unusually pleasant, as compared with the average New England March. While the weather was marked by much cloudiness and the monthly precipitation was in excess of the average, there were but 12 stormy days. The precipitation was mostly in the form of rain, and was well distributed. The temperature was near the seasonal

average, the slight departure being above the normal. There were no severe or protracted storms.

April was cloudy, wet and cold. The skies were wholly overcast on an average of 19 days and rain fell on 15 days. The precipitation was excessive in all sections, and averaged nearly double the normal amount. To add to the uncomfortable conditions of the weather was much fog in coast sections and almost continuous easterly winds throughout the State. The mean temperature averaged about 1° below the normal for the month.

The rainfall for May was in excess of the normal, so much so that at the end of the month low lands were still too wet to be worked. There were copious showers on the 1st and 2d, followed by nearly a week of clear weather. Cloudy and rainy weather was nearly continuous from the 9th to the 14th. From that date clear and seasonable weather prevailed until the 18th. From the 18th to the 20th heavy rains occurred in nearly all parts of the State. The highest temperatures of the month were on the 22d and 23d, the mercury reaching to 80° or slightly above, but during the 24th the temperature fell from 20° to 30° . The last week of the month showed cloudy weather with low temperatures. The temperature of the month did not vary greatly from the normal, but it was without the warm days usually experienced in May, making the growth of vegetation slow and backward.

June opened with a week of generally cloudy, cool weather. From the 10th to the 20th the weather was partly cloudy to clear, with almost an entire absence of rain, followed by a season of showers from the 21st to the 25th. The last 4 days of the month were excessively warm. Viewing the month as a whole, the precipitation was largely deficient, being little more than half the normal. The average temperature was several degrees above the normal. There was less than the usual number of thunderstorms, and they were generally less violent than usual. The winds were southerly to westerly. Considered as a whole for the entire State, June was a very pleasant month.

The first three days of July showed the same excessive heat that prevailed in the last days of June. The tempera-

ture ruled high throughout the month, and was the most conspicuous feature of the month. From the 14th to the 24th the daily excesses ranged from 6° to 13° above the normal. There was a drop in the temperature on the 25th, and at the close of the month conditions were nearly seasonal. Taken as a whole, the daily mean temperature was about 2° in excess of the average for July. Showers occurred quite frequently, and were generally well distributed over the State. For the larger portion of the district the monthly precipitation was somewhat in excess of the normal, but in some eastern sections there was some complaint of drought.

The weather of August, as a whole, was not marked by unusual extremes or conditions exceptional to the season. While the temperature averaged slightly above the normal, no very high temperatures occurred, or periods of excessive heat. The nights were seasonably warm. The average temperature for the entire month was about 1° in excess of the normal for August. The cloudiness and sunshine were nearly equal during the first 10 days, followed by a period extending to the 26th with cloudiness somewhat in excess of sunshine. Showers were of frequent occurrence, generally at intervals of three or four days; but the rainfall was in light to moderate amounts until the night of the 24th, when very heavy showers occurred in the greater part of the eastern portion of the State. Though the rainfall of the month was below the normal, the frequency of the showers made it sufficient to keep vegetation in flourishing condition.

The weather of September was uneventful, and characteristic of the season. The first decade was marked by fair weather, mostly with abundant sunshine. Showers on the 11th and 12th were succeeded by several pleasant days. Well-distributed showers fell from the 16th to the 21st, during which period most of the precipitation of the month occurred. There was little complaint of dry weather, and the conditions were most favorable to harvesting and fall seeding. The temperature during the month was almost uniformly high, ranging from 1° to 2° above the normal. The first cool weather occurred on the 20th and 21st, with light to moderate frosts. Frosts also occurred on the 25th, but they were generally too light to greatly damage vege-

tation. Viewing the month as a whole, the weather was very pleasant.

THE WEATHER OF OCTOBER, 1901.

The weather of the month was exceptionally pleasant, with a preponderance of warm sunny days. The precipitation was deficient, the monthly amounts being from 1.25 inches to 1.50 inches below the normal for October. The rainfall of the month occurred chiefly during the storm of the 14th and 15th. No rain of any consequence fell after this storm. At the close of the month there is urgent need of rain in some sections, and especially in those of the eastern portion of the State. The temperature has ranged above the normal for nearly the entire month, and the average excess amounted to about two degrees per day. Like September, it was, however, well distributed and there were no unusual maxima readings. Frosts, moderate to heavy, occurred through the month in about all sections, except those of the immediate coast, where the first occurrence was the morning of the 26th, when it was sufficiently severe to kill vegetation, except in protected places. The mild weather and abundant sunshine have been very favorable to grass lands, to pasturage for stock, to fall ploughing, seeding, and to all farm operations and out-door work. No severe or destructive wind storms passed over the State during the month. Brisk to high winds occurred on the 19th and 28th, but caused little if any damage. Local disturbances, thunderstorms and hail, were reported from some localities, but they were of slight importance and only worthy of passing notice. Viewed as a whole, the weather of October was remarkably fine and such as is not likely to be often paralleled.

CROPS OF THE YEAR.

The excessive rains and cool weather of May made the season from one to two weeks late at the close of the month, with farm work still further behind the normal. Pastures and mowings were generally in good condition, and promised well for the future. Fall seeding generally wintered well. The fruit bloom occurred at about the usual time in western sections and a few days later in eastern, and was

good for all kinds of fruit except apples, which were light. Insects were doing practically no damage. Spraying was reported as increasing, but not as rapidly as it should. There was, generally speaking, a fair supply of fairly good farm help. Wages average about \$18 per month with board and \$1.25 per day without board. Indications were that the acreage of corn and tobacco would be slightly increased, with perhaps a slight decrease in that of potatoes.

Not for many years has there been as little complaint of injury from insects as in June. Corn was very small and backward, but with a good stand and average acreage. Haying was generally beginning, and a good crop was generally expected. The acreage of early potatoes showed a slight decrease, and they were backward because of late planting, but looking well. Early market garden crops were about average as to yield and price, though somewhat backward. The quantity and price of dairy products was about as the previous year, with the supply of dairy cows less than the demand. Pasturage was much benefited by the early rains, and was generally in first-class condition. Strawberry picking had begun, with the prospect of an average crop with good prices. Apples gave indications of a light crop, especially of winter varieties; peaches light; plums and cherries good; pears average.

In July potato bugs and squash bugs appeared to be rather more numerous than usual, but other insects were doing no particular damage. Indian corn came forward very rapidly, and was generally in good condition and growing fast. Silos gain in favor constantly but slowly. Haying was practically completed, with a larger crop than for the last two years, probably a full average crop; quality good, though there was some injury from showers. Returns indicated an increased acreage of forage crops, and they were generally in good condition. Market garden crops suffered from the hot weather, but later ones promised well; prices rather higher than usual. Very few potatoes were dug at time of making returns, so that no idea could be formed as to yield or prices of the early crop. Apples dropped badly, still further reducing the crop; pears and peaches promised light crops; plums reported as dropping badly; quinces good;

grapes promised well. Pasturage came through the dry weather surprisingly well, and was in good condition. Rye was an average crop; oats off in condition; barley promised well as a forage crop.

Indian corn, although still somewhat backward, made a great growth during August, and was generally reported as earing well. Rowen generally promised very well. Early potatoes were a very light crop; later ones made a great showing of vines, but did not set well, and the prospect was for not more than a fair crop at best. The acreage of tobacco was increased and the crop in excellent condition, with cutting practically completed at the end of the month. Apples promised to be one of the lightest crops on record; pears light to fair; peaches light; grapes promised well, as did also cranberries. Pastures were almost everywhere in excellent condition. Oats and barley were below the average for grain and straw. Poultry keeping was generally reported as profitable, but the attention paid to it was not as great as the profit from it warrants.

The warm weather of September ripened Indian corn in excellent condition, and the crop was one of the best ever secured. An unusually good crop of rowen was reported in all sections. Fall feed was also in excellent condition, and pastures and mowings should start another season in excellent condition. Less than the usual amount of fall seedling had been done, owing to the rains and the backward condition of farm work, but that which was up promised well. Onions were less than an average crop. Potatoes, while somewhat uneven, were considerably below the normal in yield, with many reports of rot. Root crops were generally in excellent condition. Celery was also a good crop. Apples did not promise much over one-fourth crop; pears fair; peaches nearly up to the average, though not a full crop; grapes generally good; cranberries fully an average crop, and mainly secured in good condition.

In the circular to correspondents returnable to us October 23 the following questions were asked:—

1. Have root crops proved to be average crops?
2. What is the condition of farm stock?

3. What is the condition of fall seeding?
4. How have prices for crops raised for market compared with former years?
5. Which of the leading crops in your locality do you think have been most profitable?
6. Which of the leading crops in your locality do you think have been least profitable?
7. Considered as a whole, has the season been a profitable one for your farmers?
8. Are torches or smoke used to any extent to prevent frost, and, if so, with what success?

Returns were received from 157 correspondents, from which the following summary has been made:—

ROOT CROPS.

Root crops have generally proved to be good average crops, the great majority of correspondents so reporting. Of those reporting them to be in other than average condition a majority speak of them as not up to the average, but the number is so small as not to materially affect the estimate as to the crop. Potatoes are a light crop in almost all sections, with a great deal of rot reported, but prices received have been higher than for some years. Celery appears to be a good crop.

FARM STOCK.

Farm stock is almost universally reported to be in good condition, and many correspondents speak of it as "very good" or "excellent." Feed in pastures has been good all the season and still continues to be so, the mild weather and frequent rains having been very favorable to it. Stock should therefore go to the barns in first-class condition.

FALL SEEDING.

Less than the usual amount of fall seeding was done, as the rains of September made it difficult to prepare the ground in some cases, and farm work was also behind at that time. That which was sown early is in excellent condition and the late seeded made a good catch, the only difficulty with it

being that it is not as forward as is usually thought desirable at this time. The weather has been and still continues peculiarly favorable to late seeding.

PRICES.

Of the 152 correspondents answering the question as to prices received for crops raised for market, 102 speak of them as higher than usual, and 50 as average, not 1 referring to them as lower than in former years. This is quite likely due in a large measure to the shortage of particular crops, notably potatoes and apples, and the natural trend of prices with normal yields is impossible to determine.

MOST PROFITABLE CROPS.

There is much diversity of opinion among correspondents as to the crops which have proved most profitable, but 74, a bare majority, unite in placing hay among them. Fifty-eight, a large number to unite on a second crop, consider corn to have been among the most profitable crops. Whenever rot was not destructive the high price of potatoes more than made up for the shortage in yield, and 29 correspondents mention this crop. Nine consider tobacco to have been among the most profitable crops; 9, cranberries; 7, onions; 5, asparagus; 5, tomatoes; 4, apples; 4, sweet corn; 4, cabbages; 3, ensilage corn; 3, celery; 3, strawberries; 3, rye; 2, milk; 2, squashes; 2, pears; 2, oats; 1, raspberries; 1, small fruits; 1, market-garden crops; 1, beans; 1, peaches; 1, grapes; 1, forage crops; 1, vegetables; 1, root crops; and 1, lettuce.

LEAST PROFITABLE CROPS.

Seventy-nine correspondents, an unusually large number to unite on any one crop as among the least profitable, speak of potatoes as among the least profitable crops; 38, apples; 15, squashes; 6, oats; 6, cabbages; 6, corn; 5, fruit; 5, milk; 4, onions; 3, peas; 3, beans; 3, cucumbers; 3, turnips; 2, peaches; 2, strawberries; 2, melons; 2, asparagus; 2, carrots; 2, cranberries; 1, tomatoes; 1, root crops; 1, sweet corn; 1, raspberries; 1, blackberries; 1, buckwheat; and 1, beets.

PROFITS OF THE SEASON.

Judging from the returns the season just closing has been rather more profitable than usual for our farmers. Potatoes and apples are the only principal crops showing a general shortage, and the unusually high prices received for these crops have made up in a measure, though probably not entirely, for this shortage. The heavy hay crop has been particularly to the advantage of our dairy farmers, and the good corn crop comes in well with the present shortage elsewhere and the prevailing high prices of grain. Of 151 correspondents answering the question as to the profits of the season, 86 regard the season as profitable, 17 as an average one for profit and 19 as fairly profitable, while 29 think that it has not been a profitable one.

USE OF SMOKE TO PREVENT FROST.

The special inquiry as to the use of smoke to prevent injury from frost did not develop much of interest. About a dozen correspondents report that smoke has been used in their vicinity to protect cranberries, strawberries, peach buds or vegetables, with varying success, the majority holding that the success achieved has not been such as to particularly commend the practice.

NOTES OF CORRESPONDENTS.

[Returned to us October 23.]

BERKSHIRE COUNTY.

Sheffield (DWIGHT ANDREWS). — Root crops are about average crops. Farm stock is in very good condition. Fall seeding is in good condition, but little was done. Prices for crops raised for market have been about average. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Torches or smoke have not been used to any extent to prevent frost.

Tyringham (E. H. SLATER). — Root crops have proved to be average crops. Farm stock is in better condition at this time than last year. Crops raised for market have all brought good prices. Tobacco and potatoes have been our most profitable crops. It has been a profitable season for our farmers. Torches or smoke have not been used to any extent to prevent frost.

Lee (A. BRADLEY). — Farm stock is in first class condition. Fall seeding is in excellent condition. Prices for crops raised for market have been fully up to former years. Hay has been our most profitable crop and oats our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Neither torches nor smoke are used to prevent frost.

Richmond (T. B. SALMON). — Root crops are up to the usual average. Farm stock is in about average condition. Very little fall seeding has been done. Prices for crops raised for market are up to the average. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Neither torches nor smoke are used to prevent frost.

Peru (J. P. SENNETT). — Root crops are up to the usual average. Cattle have taken on flesh readily and are in good condition. Not much fall seeding is done in this locality. Prices for farm crops have been about the same as usual, except for apples and potatoes, which are higher. Hay has been our most profitable crop and

apples our least profitable one. The season has been, on the whole, above the average for profit.

Dalton (WESLEY B. BARTON). — Root crops are up to the usual average. Farm stock is in fair condition. Fall seeding is in good condition. Prices for crops raised for market have been better than in former years. Corn has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Torches or smoke are not used in this section to prevent frost. The fall rains have put the pastures and mowings in excellent condition while fall feed has been very good.

Windsor (W. H. TIRRELL). — Root crops have proved to be average crops. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have maintained a good average. Potatoes have been our most profitable crop. I think that the season has been a profitable one for our farmers considered as a whole. Torches or smoke are not used to prevent frost.

Hancock (C. H. WELLS). — Root crops are up to the usual average. Farm stock is in good condition. No fall seeding has been done. Prices for crops raised for market have ruled higher than in former years. Hay has been our most profitable crop, with potatoes second, although they have developed considerable rot. Considered as a whole the season has been a profitable one for our farmers. Torches or smoke are not used to ward off frost.

Clarksburg (E. W. GLEASON). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in very good condition. Prices for farm produce are somewhat higher than usual. Corn has been our most profitable crop and potatoes our least profitable one. Potatoes are not more than half a crop and there are almost no apples at all, but with good hay and corn crops, plenty of rowen and fall feed, beef, poultry, milk and eggs selling well, the farmers in this vicinity have had rather better than an average season for profit.

FRANKLIN COUNTY.

Monroe (D. H. SHERMAN). — Root crops have mostly proved to be average crops. Farm stock is in fair condition. No fall seeding was done here. Prices for crops raised for market have been about average. Hay has been our most profitable crop and apples our least profitable one. Considered as a whole the season has been a medium one for profit. Torches or smoke are not used to ward off frost.

Gill (F. F. STOUGHTON). — Root crops are not much raised. Farm stock is in good condition. Some crops have brought higher prices than usual. Hay has been our most profitable crop and potatoes our least profitable one. I think that the season has been a profitable one for our farmers. Neither torches nor smoke are used to prevent frost.

Shelburne (G. E. TAYLOR). — All farm stock is in fine condition. Fall seeding is in good condition. The prices for crops raised for market are somewhat higher than usual. Hay has been our most profitable crop and potatoes our least profitable one. The season has been favorable, but its results are still largely in the future. Dairy products are not in proportion to the cost of feed. Torches or smoke have not been used to prevent frost.

Deerfield (CHAS. JONES). — Root crops are nearly average crops. Farm stock is looking well with plenty of feed in pastures. Fall seeding is looking finely. Tobacco is curing well with the prospect of selling for a good price. Onions are a light crop, but are selling for a good price. Indian corn is a good crop and nearly all harvested. Potatoes are very uneven, some fields yielding well and others very lightly. Considered as a whole the season has been a profitable one for our farmers.

Sunderland (J. M. LEGATE). — Root crops have not proved to be average crops. Farm stock is looking well. Fall seeding is in fine shape. Prices for crops raised for market have been above the average. Onions have been our most profitable crop. It is hard to say what crop has been least profitable, but I think corn. The season has probably been a profitable one for our farmers and it surely will be if they get a good price for their tobacco.

Wendell (N. D. PLUMB). — Root crops are normal crop. Farm stock is looking well. But very little fall seeding has been done as yet. The best prices for ten years have been obtained for crops raised for market. Potatoes and hay have been our most profitable crops and apples and root crops our least profitable ones. Considered as a whole the season has not been a profitable one. Torches or smoke are not used to prevent frost.

Northfield (T. R. CALLENDER). — Root crops are fully up to the average. All farm stock is looking well, pasturage having been better than for many years. New seeded land is in particularly good condition. Prices for crops raised for market have advanced all along the line. Tobacco has been our most profitable crop and cucumbers for pickling our least profitable one. The season has been a profitable one generally speaking. Farmers are still mowing rowen. Fall work is well along, all potatoes being dug and

husking well advanced. Some, with full barns, are husking standing corn, and leaving the fodder to be ploughed in in the spring.

New Salem (DANIEL BALLARD). — Root crops have made about average yields. Farm stock is looking well. Farm seeding is in good condition. Crops raised for market have brought full average prices. Grass and corn have been our most profitable crops and apples our least profitable one. Potatoes were profitable to those who secured good crops. I think the season has been fairly profitable. Dairy products have brought good prices through the season and pork has not been as high for many years as now, but meal and feed being higher will diminish the profit of feeding considerably.

HAMPSHIRE COUNTY.

Ware (J. H. FLETCHER). — Root crops have proved to be average crops. Farm stock is in very good condition. Not much fall seeding was done this year. Prices of crops raised for market have compared well with other years. Potatoes and corn have been our most profitable crops and apples and peaches our least profitable ones. I think that the season has been a profitable one, considered as a whole. None of our farmers have used torches or smoke to prevent frost.

Enfield (D. O. CHICKERING). — Root crops are not up to the average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market are somewhat better than in former years. Hay and corn have been our most profitable crops and potatoes and fruit our least profitable ones. Considered as a whole the season has been a profitable one for our farmers. Torches or smoke are not used to prevent frost.

Pelham (J. L. BREWER). — Root crops are up to the usual average. Fall seeding is in fair condition. Farm stock is in excellent condition. Prices for crops raised for market are fully as high as in former years. Corn has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Neither torches nor smoke are used to prevent frost.

Amherst (Wm. P. BROOKS). — Root crops are considerably above the usual average in condition. Farm stock is in excellent condition. Fall seeding is in excellent condition. Prices have been above the average for most crops. Tobacco, onions, potatoes, corn and hay have been our most profitable crops and apples, dairy products and squashes our least profitable ones. Considered as a whole the season has been an unusually profitable one. Neither torches nor smoke are used to prevent frost.

Granby (G. A. BLISH). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition where put in early. Grass has been our most profitable crop with potatoes second. Cabbages have been our least profitable crop. Considered as a whole the season has been a profitable one for our farmers. Torches or smoke are not used to prevent frost.

South Hadley (H. W. GAYLORD). — Root crops have not been up to the average as a whole. Farm stock is looking finely, and the pastures are still furnishing a good amount of feed. Fall seeding is looking well. Grass has been our most profitable crop. Considering the cost of production potatoes have been our least profitable crop, although the per cent of a full crop will be smaller in the case of apples. The season has not generally been a profitable one to our farmers, although where they have run to specialties, as tobacco, it has been profitable.

Southampton (C. B. LYMAN). — Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is in fair condition, though rather later than common. Prices for farm crops are rather better than common but farmers have less to sell. Hay, corn and tobacco have been our most profitable crops and potatoes and apples our least profitable ones. The general opinion among our farmers appears to be that the season has not been as profitable as in average years.

Westhampton (H. A. PARSONS). — Root crops are not up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market are higher than in former years. Corn for ensilage has been our most profitable crop and potatoes our least profitable one on account of the rot. Considered as a whole the season has been a profitable one for our farmers. Torches or smoke are not used to prevent frost.

Chesterfield (HORATIO BISBEE). — Root crops are not up to the usual average. Farm stock is in good condition. Fall seeding is in fairly good condition. Prices for crops raised for market, including hay, are fairly good. Hay and corn have been our most profitable crops and potatoes and apples our least profitable ones. The season has not been more than an average one for profit with our farmers. Torches or smoke have not been tried here to prevent frost.

HAMPDEN COUNTY.

Blandford (E. W. BOISE). — All root crops have done extra well. On account of fall rains pastures have been good and stock will come to barns in extra good condition. Fall seeding is

in about average condition. Prices for farm crops are fully up to the average, perhaps somewhat above. Corn has been our most profitable crop and potatoes our least profitable one. The season has not been an average one for profit as there are no apples to sell and few, if any, potatoes. Torches or smoke are not used to prevent frost.

Southwick (L. A. FOWLER). — Root crops have not proved to be average crops. Farm stock is in good condition. Fall seeding is looking well. Prices for crops raised for market have been slightly higher than usual. Tobacco has been our most profitable crop and corn and potatoes our least profitable ones. The season has not been a profitable one for our farmers unless they have raised tobacco.

Westfield (C. F. FOWLER). — Root crops are not up to the usual average. Farm stock is reported to be in very good shape. Most fall seeding is late, but the early seeding is looking finely. Crops raised for market have so far brought a full average price or above. Tobacco, onions, hay and corn, in the order named, have been our most profitable crops, and potatoes our least profitable one. Considered as a whole the season has been a fairly profitable one for our farmers. Weeds have made extraordinary growth, particularly in potato fields.

West Springfield (T. A. ROGERS). — Root crops are not up to the usual average. Farm stock is generally in good condition. Fall seeding is looking well but is late. Prices for crops raised for market are good but crops small. Hay and rye have been our most profitable crops and potatoes and fruit our least profitable ones. The season has been a hard one for farmers in this vicinity. I do not know of either torches or smoke being used to prevent frost.

Chicopee (R. W. BEMIS). — Root crops are a little above the average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been up to the usual average. Corn, rye and oats have been our most profitable crops and potatoes our least profitable one. Considered as a whole the season has been a profitable one. Neither torches nor smoke are used to prevent frost.

Hampden (J. N. ISHAM). — Root crops have been much below the average, turnips a short crop with but few good fields. Stock is coming towards winter in good condition. Fall seeding is looking finely. Prices for our market crops are better than for a few years past. Hay and potatoes have been our most profitable crops and apples and squashes our least profitable ones, the latter being an entire failure. Farmers have generally reason to be satisfied

with the money returns of the season, though the higher price of grain has somewhat reduced the net profit.

Wilbraham (H. M. BLISS). — Root crops are up to the usual average. Farm stock is in good condition. Early fall seeding is in good condition. Prices for crops raised for market have been fully up to the average. Grass and potatoes have been our most profitable crops and apples our least profitable one. Considered as a whole the season has been a fairly profitable one. Torches or smoke are not used to prevent frost.

Monson (A. H. WHITE). — Root crops are not up to the usual average. Farm stock is in fair condition. Fall seeding is in good condition. Prices for crops raised for market have been rather better than usual. Hay, apples and corn have been our most profitable crops and potatoes our least profitable one. Considered as a whole the season has been fairly profitable with our farmers. Neither torches nor smoke are used to prevent frost.

Brimfield (C. S. TARBELL). — Root crops have been up to the usual average. Farm stock is looking well. Fall seeding is in good condition. Prices for crops raised for market have averaged a little better than usual. Owing to the high prices of western grain corn has been our most profitable crop. Considered as a whole the season has been a profitable one for our farmer. Torches or smoke are not used to prevent frost.

WORCESTER COUNTY.

Southbridge (G. L. CLEMENCE). — Potatoes are a short crop and are rotting to some extent. Farm stock is looking well. Fall seeding is above the average in condition. Taking the average of all crops raised for market they have sold for a little better prices than in former years. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a profitable one.

West Brookfield (L. H. CHAMBERLAIN). — Root crops are up to the usual average. Farm stock is in good condition. But little fall seeding was done, but that put in is looking finely. Prices of crops raised for market have been better than in former years. Corn has been our most profitable crop and oats our least profitable one. Considered as a whole the season has been a profitable one. One individual has used smoke to prevent frost with good success.

New Braintree (C. D. SAGE). — Farm stock is in good condition and cows are holding out well. Very little fall seeding was done. Very little is raised for market except milk and a few potatoes. Corn is a fine crop, while the hay crop is perhaps the most

profitable. Potatoes are a very light crop and there are no apples. The season has been fairly profitable, though many will miss the proceeds of the apple crop. Cows have done well and though milk is low it pays better than anything else a farmer can raise on these hill farms.

Oakham (JESSE ALLEN). — Root crops have proved to be good average crops. Farm stock is in excellent condition. Fall seeding is in excellent condition. The prices for crops raised for market have been fully average. Milk has been our most profitable product as grass and fall feed have been abundant. Fruit has been our least profitable product. Considered as a whole the season has been a profitable one. Neither torches nor smoke are used to prevent frost.

Hubbardston (C. C. COLBY). — Root crops have been far below the average in yield. Stock is looking well and prices hold high. Fall seeding is looking excellently. All produce has been bringing good prices, generally above the average. Corn has been our most profitable crop. Potatoes have been below the average in yield, but above in price. Considered as a whole the season has been an unusually good one for our farmers. Torches or smoke are not used to prevent frost.

Templeton (LUCIEN GOVE). — Root crops are uneven and hardly average crops. Farm stock is in quite good condition. The weather conditions have been favorable to fall seeding, but little has been done. The range of prices for crops raised for market has been higher than for some time. Hay, corn, cabbages, forage crops and roots have been our most profitable crops and apples and other fruits, potatoes, peas and squashes our least profitable ones. The season has been less profitable than usual, for although prices were good salable crops were light.

Royalston (C. A. STIMSON). — Root crops are up to the usual average. Farm stock is in fine condition. Fall seeding is in fair condition. Prices for crops raised for market have been higher than in former years. Corn has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Neither torches nor smoke are used in this locality to prevent frost.

Ashburnham (E. D. GIBSON). — Carrots are a light crop and beets and turnips hardly average. Farm stock will go into the barns in fine condition. Fall seeding put in in August and early September looks well. Prices for crops raised for market have been better than in former years. Indian corn has been our most profitable crop. Squashes have been a dead failure. The season has been a fairly profitable one, better than in 1900. Hardly

any fall ploughing has been done, but the soil is now just right for it.

Fitchburg (JABEZ FISHER). — Root crops, except potatoes, are good average crops. Fall seeding is in promising condition. Prices for crops raised for market have been fully as good as in former years. Among fruits pears and grapes have been most profitable and peaches, blackberries and raspberries least profitable. Smoke was tried some years ago as a preventative of frost, but never gave much satisfaction. There has been only a trifling frost to date (the 23d) which is a record for many years.

Harvard (J. S. PRESTON). — Root crops are good average crops. Farm stock is looking well and pastures and fall feed are holding out well. Fall seeding is looking well and the average amount has been done. Prices for crops raised for market are a little higher than usual. Hay and corn have been our most profitable crops and potatoes our least profitable one. The season has not been very profitable, as all crops except hay and corn are short.

Shrewsbury (T. F. MARSTON). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in extra good condition. The prices for crops raised for market are somewhat higher than usual, but most crops did not give a full yield. Corn has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Neither torches nor smoke are used to prevent frost.

Worcester (S. A. BURGESS). — Root crops are more than average. Farm stock is looking well and pastures have been good. Fall seeding is looking well. Crops of all kinds have sold well. Corn has been our most profitable crop and apples our least profitable one, being nearly a failure. The season has been a profitable one, as most crops have been good.

Upton (B. A. JOURDAN). — Root crops are good average crops. Farm stock is in fine condition. Fall seeding is in very good condition. Crops raised for market have brought fair average prices. Grass has been our most profitable crop and potatoes and apples our least profitable ones. Considered as a whole the season has been a fairly profitable one for our farmers. Neither torches nor smoke are used to prevent frost.

Milford (J. J. NUTTER). — Root crops are about average crops. Farm stock is in good condition. Fall seeding is in very good condition. There has been a slight increase in the prices received for crops raised for market. Hay and peaches have been our most profitable crops and potatoes and apples our least profitable ones. Considered as a whole the season has been a little below

the average for profit. Torches or smoke are not used to prevent frost.

Sutton (C. P. KING). — Root crops are about average crops. Farm stock is all in fine condition. Fall seeding is in good condition and the late sown is coming up well. Prices for crops raised for market are higher than in former years. Hay and cabbages have been our most profitable crops and potatoes our least profitable one. Considered as a whole the season has been a profitable one for our farmers.

Douglas (J. M. RAWSON). — Root crops are not up to the average in this section. Farm stock is looking finely. Fall seeding is all right. Better prices have obtained for crops raised for market than in former years. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been by no means a profitable one. I do not know of torches or smoke having been used to prevent frost.

MIDDLESEX COUNTY.

Framingham (J. S. WILLIAMS). — All root crops are up to the average. Young stock and cows out for the season are returning from the pastures in good condition. The majority of farmers are seeding late this season. Almost every market crop has sold much higher than usual. Tomatoes, potatoes and onions have been our most profitable crops, and carrots, beets, turnips and beans our least profitable ones. The season has been the most profitable for years. We resort to smoke to protect the strawberry beds in May, also for tomatoes and squashes in early fall.

Marlborough (E. D. HOWE). — Root crops are good average crops. Farm stock is in good condition with plenty of fall feed. Fall seeding looks well. Prices for farm crops have been slightly higher than usual. Potatoes have been the most profitable crop for those who had them. Considered as a whole the season has been fairly profitable. With most of our farmers milk is the specialty and not nearly enough vegetables are raised to supply the local demand. Owing to the high price of feed less is being fed than formerly and the supply of milk is barely equal to the demand.

Sudbury (E. W. GOODNOW). — Root crops of all kinds are below the average. Farm stock is looking fairly well. Fall seeding is looking well. Crops have sold well compared with previous years. Apples, squash and celery have been our most profitable crops and cabbages and potatoes our least profitable ones. Considered as a whole the season has been a profitable one for most

farmers, as while crops have been short prices have been far above the average. Torches or smoke are not used to any extent to prevent frost.

Stow (G. W. Bradley). — Root crops are about the same as in former years. Farm stock is looking well. Fall seeding looks better than for some years. Prices for crops raised for market have averaged better than for some years. Potatoes have been our most profitable crop and sweet corn our least profitable one. Considered as a whole the season has been a more profitable one than for some years. Torches or smoke are not used at all to prevent frost.

Maynard (L. H. Maynard). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is looking well. Prices of market crops have ruled higher than for several years. All crops have done well. Considered as a whole the season has been a profitable one. I have known smoke to be used to save strawberries and asparagus in the spring with good success, the only difficulty being to make the smoke go where it is wanted.

Littleton (GEO. W. SANDERSON). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in excellent condition. Prices for crops raised for market have compared favorably with other years. Hay has been our most profitable crop and apples our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Torches or smoke are but very little used to prevent frost.

Tyngsborough (O. L. WRIGHT). — Root crops are up to the usual average. Farm stock is looking well. Fall seeding is looking well. Prices for crops raised for market have been a little higher than in former years. Potatoes have been our most profitable crop and cranberries our least profitable one. Considered as a whole the season has been an average one for profit. Smoke has not been used in any way to prevent frost in this section.

Pepperell (P. J. KEMP). — Root crops have proved to be more than average crops. Farm stock is in good condition. Fall seeding is looking finely. Prices for crops raised for market are better than for several years. Hay has been our most profitable crop and potatoes our least profitable one. The season has been as profitable as any year, but there is not much profit for the common farmer. Torches or smoke are not used to prevent frost.

Concord (Wm. H. HUNT). — Root crops are up to the usual average. Farm stock is in fair average condition. Fall seeding is looking well. Prices for crops raised for market have been a little above the average. Asparagus, strawberries, tomatoes and sweet

corn have been our most profitable crops and potatoes and melons our least profitable ones. Considered as a whole the season has been a profitable one for our farmers.

Bedford (HENRY WOOD).—Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is rather late. Prices for crops raised for market have been very good. Strawberries have been our most profitable crop and asparagus our least profitable one. The season has been a very fair one for profit considered as a whole. Torches or smoke are not used to prevent frost.

Woburn (W. H. BARTLETT).—Root crops have generally been good. Farm stock is in good condition. Fall seeding is in good average condition. Prices for crops raised for market have been a little better than usual. Tomatoes and lettuce have been our most profitable crops. Cucumbers have been almost a failure and potatoes are a poor crop. The season has been fully an average one for profit. Winter squashes are about half a crop, but are selling for double the usual price. Celery is a good crop.

Winchester (MARSHALL SYMMES).—Root crops are rather above the average. Farm stock is in good condition. Fall seeding is in good condition. Prices for crops raised for market have been as high as for several years. String beans have been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a profitable one for our farmers. There is not half a crop of squashes and almost no winter apples. Grain is a little more than double the price it sold for in 1897, while milk and eggs are just the same price.

Arlington (W. W. RAWSON).—Root crops are up to the usual average. Prices for crops raised for market have been better than for the last two years. All crops have paid fairly well, but there has been no great profit in out-door crops. Considered as a whole the season has been a profitable one.

ESSEX COUNTY.

Haverhill (EBEN WEBSTER).—Root crops are not quite up to the average. Farm stock is in good condition. Fall seeding looks well. Prices for crops raised for market are rather higher than average. Hay has been our most profitable crop. Considered as a whole the season has been rather better than an average one for profit. Torches or smoke are not used to prevent frost.

Groveland (ABEL STICKNEY).—Root crops are up to the usual average, or nearly so. Farm stock is in good condition. Fall

seeding looks first-class. Prices for crops raised for market have been more than average. Hay and corn are our most profitable crops while those least profitable are too numerous to enumerate. With some the season has been a profitable one and with others it has not. Torches or smoke are not used to prevent frost.

Newbury (G. W. ADAMS). — Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is in fair to average condition. As a rule prices for crops raised for market have been rather higher than usual. Hay and potatoes have been our most profitable crops and onions our least profitable one. I should consider the season an average one for profit, although the total failure of the apple crop must be taken into account. Scarcity of decent farm help prevents development of profitable acreage in some of our leading crops.

Andover (M. H. GOULD). — Root crops are up to the usual average. Farm stock is in fairly good condition. Fall seeding is in good condition. Prices for crops raised for market have been higher than in former years. Sweet corn, cranberries and hay have been our most profitable crops and potatoes, cucumbers for pickling and onions our least profitable ones. Considered as a whole I do not think the season has been a profitable one for our farmers. Smoke has never been used about here to prevent frost.

Topsfield (B. P. PIKE). — Root crops are good crops. Farm stock is in very good condition. Fall seeding is all right. Potatoes bring a little higher price than usual. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has not been a profitable one for our farmers. The price of grain is high and that of milk the same as usual. Torches or smoke are not used to prevent frost.

Manchester (JOHN BAKER). — Root crops are good average crops. Farm stock is in very good condition. Fall seeding is in good condition. Prices for crops raised for market have been higher than usual on the average. Corn, pears and celery have been our most profitable crops and potatoes, apples and squashes our least profitable ones. Cabbages are low and cranberries are a poor crop. Torches or smoke are not used to prevent frost.

NORFOLK COUNTY.

Randolph (R. A. THAYER). — Root crops are up to the usual average. Farm stock is in excellent condition. Fall seeding looks very promising. Crops raised for market have brought good average prices. Hay and corn have been our most profitable crops

and potatoes and squashes our least profitable ones. The large amount of rainfall during the summer has put upland mowings and pastures into unusually fine condition. Very little low land or meadow hay has been secured as the land is covered with water.

Stoughton (C. F. CURTIS). — Root crops have proved to be average crops. Farm stock is in extra good condition. Fall seeding is in the best of condition as there has been plenty of rain. Prices for crops raised for market have been much better than usual, but yields have been less. Corn for the silo has been our most profitable crop and cabbages our least profitable one. Considered as a whole the season has been a profitable one, as our farmers have plenty of hay and rowen and pastures have been good all the season. Poultry raisers are lamenting the high cost of corn, \$1.45 per bag, and some are congratulating themselves that they planted field corn and find that it pays.

Medfield (GEO. R. CHASE). — Root crops are not average crops. Farm stock is in excellent condition. Fall seeding is above the average in condition. Prices for crops raised for market have been good. Grass has been our most profitable crop and corn our least profitable one. Considered as a whole the season has not been a profitable one for our farmers. Cord wood was formerly burned to ward off frost from the peach crop, but I hardly think that it paid.

Millis (E. F. RICHARDSON). — Root crops are up to the usual average. Farm stock is in fine condition. Fall seeding is in good condition. Prices have been low on cabbage, average on beets and carrots, and very high on all other crops. Grass and potatoes have been our most profitable crops and fruit our least profitable one. Considered as a whole the season has been a very fair one for profit for our farmers. Torches or smoke are not used to prevent frost.

Norfolk (GEO. E. HOLBROOK). — Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is in extra fine condition. Prices for crops raised for market are better than the average. Corn and vegetables are our most profitable crops and potatoes and apples our least profitable ones. Considered as a whole the season has been a profitable one. I know of no one using either torches or smoke to prevent frost.

Foxborough (E. A. MORSE). — Root crops have not proved to be average crops. Farm stock is in good condition. Fall seeding is looking finely. Prices for crops raised for market have been rather above the average. Small fruits, strawberries and raspberries have been our most profitable crops and potatoes our least

profitable one. I think that the season has been a profitable one considered as a whole. Torches or smoke are not used to prevent frost.

BRISTOL COUNTY.

Easton (H. M. THOMPSON). — Root crops are not up to the usual average. Farm stock is in good condition. Fall seedling is in good condition. Prices for crops raised for market are better than usual. Hay and milk have been our most profitable products and corn our least profitable one. The season has averaged to be a profitable one with our farmers. Torches or smoke are not used to prevent frost.

Norton (Wm. A. LANE). — Root crops have proved to be up to the usual average. Farm stock is in good fair condition. Fall seedling is looking well. Prices for crops raised for market have been about average. Hay and corn have been our most profitable crops and potatoes our least profitable one. The season has been a fairly profitable one. Neither torches nor smoke are used to prevent frost.

Berkley (R. H. BABBITT). — Root crops are up to the usual average. Farm stock is in very good condition. Fall seedling is below the average in condition. Prices for farm crops have been better than for many years. Cabbages have been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been better than an average one for profit. I know of no one about here who has tried the use of smoke to prevent frosts.

Dighton (J. N. PAUL). — Root crops are up to the usual average. Farm stock is in good condition. Fall seedling is in good condition. Prices for crops raised for market have been better than in former years. Potatoes have been our most profitable crop and strawberries our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Neither torches nor smoke are used to prevent frost.

Dartmouth (L. T. DAVIS). — Root crops have proved to be average crops. Farm stock is fully up to the average in condition. Fall seedling is very promising. There is not much change in the prices of farm crops. Hay and corn have been our most profitable crops and potatoes our least profitable one. As a whole the season just ending has been about as bad for many farmers as last year, and in some instances worse. The hay crop was good, and the corn crop in most places was also good to very good, but potatoes and many vegetables were almost an entire failure. Some of this season's disasters were caused by last year's drought. Neither torches nor smoke are used to prevent frost.

Westport (A. S. SHERMAN). — Root crops are up to the usual average. Farm stock is in first-class condition. Fall seeding is in very good condition. Prices are rather better than in average years. Hay has been our most profitable crop and potatoes our least profitable one, on account of blight and rot. The season has been as profitable as the average year, but the profits on the farm are always small. Corn made a great growth of fodder but did not ear out well. Oats did not amount to much. Turnips and cabbages promise large crops. Plenty of pears, peaches and grapes, but apples are scarce and of poor quality. We have had very little frost this fall and pastures are looking finely.

PLYMOUTH COUNTY.

Brockton (DAVIS COPELAND). — Root crops are about three-fourths crops. Farm stock is in good condition. Fall seeding looks well. Prices for crops raised for market are fully as good as usual, and perhaps a little better. Hay has been our most profitable crop and peas our least profitable one. The season has hardly been a profitable one, those who have made a profit being lucky. With some of our farmers the potato crop has been most profitable, while with others it has been hardly worth digging. Torches or smoke are neither of them used to prevent frost.

Hanson (DR. F. S. THOMAS). — Root crops are far below the average. Farm stock is in good condition. Fall seeding is in good condition. Prices for farm crops average higher than usual. Potatoes very small. Almost no pumpkins or squashes. No apples worth mentioning. Summer gardens good. Hay good in quantity and quality; big second crop. Pastures good the whole season. Considered as a whole the season has been a profitable one.

Pembroke (NATHANIEL MORTON). — Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is in quite fair condition. Prices for crops raised for market have been higher than in former years. Cranberries have been our most profitable crop and apples our least profitable one. Considered as a whole the season has been a profitable one for our farmers. Torches and smoke are used somewhat to prevent frost, but with limited success.

Duxbury (S. P. SOULE). — Taken as a whole root crops have proved to be average crops. Farm stock is generally looking well. But little fall seeding has been done in this section, but that in is looking well. Prices for crops raised for market will compare favorably with other years. Potatoes have been our most profit-

able crop and turnips our least profitable one. Considered as a whole the season has been a profitable one. Neither torches nor smoke are used to prevent frost.

Kingston (GEO. L. CHURCHILL).—Root crops are more than average crops. Farm stock is in very good condition. Fall seeding is in very good condition. Prices for crops raised for market have been fully up to the standard. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole the season has been a very good one. Torches and smoke are not used to prevent frost.

Bridgewater (ROWLAND CASS).—Late root crops are good average crops. Farm stock is in excellent condition. Early fall seeding is in good condition. Prices have ranged higher this year with the exception of cabbages, for which they have been lower. Corn has been our most profitable crop and potatoes our least profitable one. Farmers appear to be in better condition financially than for some time past. I know of no one using any method to prevent frost.

Carver (J. A. VAUGHAN).—Root crops are good crops. Farm stock is in good condition. Fall seeding is in good condition. Most crops have sold quickly and for a better price than last year. Cranberries have been our most profitable crop. Neither torches nor smoke have been used to prevent frost in this vicinity.

BARNSTABLE COUNTY.

Falmouth (D. R. WICKS).—Root crops are full average crops. Farm stock is in good condition. Fall seeding is looking finely. All crops have brought prices fully up to former years. Hay has been our most profitable crop and fruit, with the exception of cranberries, our least profitable one. The fruit crop is a failure and does not promise well for the future because of the ravages of a fungus which attacks the leaves of apple and pear trees, and which has this year stripped the trees. As a whole I should say the season had been a profitable one. Torches or smoke are not used to prevent frost.

Mashpee (W. F. HAMMOND).—Root crops have been above the average. Farm stock is in very good condition. Fall seeding is looking fairly well. The prices of crops raised for market have been above the average. Cranberries have been our most profitable crop and corn our least profitable one. Considered as a whole the season has been one in which our farmers have just about held their own. Smoke from burning brush and from torches was formerly used as a preventative against frost, but after a few years trial it was given up as useless.

Barnstable (JOHN BURSLEY). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in from fair to good condition. Prices for crops raised for market have been 15 per cent above the average. Cranberries have been our most profitable crop and oats and potatoes our least profitable ones, though the latter brought very good prices. Considered as a whole the season has been a profitable one. The few experiments made with smoke or smudges to prevent frost have not seemed to do any good, the smoke rising at once and the frost being as severe ten feet from the fire as elsewhere.

Dennis (JOSHUA CROWELL). — Root crops are hardly up to the average. Farm stock is in very good condition. Fall seeding is in fair condition, but there was very little done. Prices for crops raised for market have been above the average. Cranberries have probably been our most profitable crops. The season has been a fairly profitable one. Torches or smoke have only been used in a small way to prevent frost and with varying success.

Chatham (E. Z. RYDER). — Root crops are about average with former years, with the exception of turnips, which crop is almost a failure. Farm stock is in good condition. Fall seeding looks well and considerable has been done. Prices of market crops have been a little above the average. Corn and hay have been our most profitable crops and potatoes, turnips and onions our least profitable ones. The season has been a little above the average for market gardening. Neither torches nor smoke are used to ward off frost.

Truro (D. E. PAIN). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition. Crops raised for market have brought better prices than commonly. Potatoes have been our most profitable crop. Considered as a whole the season has been a profitable one for our farmers. Torches and smoke are not used in this section to prevent frost.

NANTUCKET COUNTY.

Nantucket (WALLACE GARDNER). — Root crops are up to the usual average, turnips and mangolds very fine. Farm stock is in very good condition. Fall seeding is in fine condition. Prices for crops raised for market are about 30 per cent better than usual. Potatoes have been our most profitable crop and summer squash our least profitable one. The season has been the most profitable in my recollection. Torches or smoke are not used to prevent frost.

BULLETIN OF
MASSACHUSETTS BOARD OF AGRICULTURE.

CRANBERRY CULTURE IN SOUTH-EASTERN
MASSACHUSETTS.

By JOHN BURSLEY, *West Barnstable, Mass., Member of State Board of Agriculture.*

The cultivation of the cranberry was quite general in Barnstable County from 1850 to 1865. In the year 1850 Edward Thacher of Yarmouth submitted the management of one and one-half acres of land, set by him to the cranberry in 1846, for the premium offered by the Barnstable County Agricultural Society for the cultivation of the berry. From 1865 to 1875, or during the years following our civil war, the planting of the berry was largely increased, the high prices then received for the fruit having stimulated this increase of acreage.

While a large portion of the area then cultivated still continues to yield profitable returns, there are large tracts which, on account of their not being naturally adapted to the fruit and because of the poor management of their owners, have been allowed to return to their original condition, namely, swampy, marshy quagmires, bearing only coarse, water-loving grasses, bushes and briars. Under favorable conditions and good business management the crop continues a very profitable one, even at prices of the present season, five dollars per barrel at cape shipping points.

From 1875 to 1885 acres of bogs previously unproductive in Plymouth and Bristol counties were reclaimed and planted to the berry. Many of these tracts are of quite large areas, and are largely managed by some of the men who began the growing of the fruit in Barnstable County. The reclaiming of these large swamps, (which were totally unproductive and in many instances almost a menace to health), making them some of the most productive lands of the section, is surely evidence of good farming, and those who

have carefully managed the planting, growing, harvesting and marketing of the crop have proved to be public benefactors.

To such magnitude has the cultivation of the fruit in south-eastern New England grown that the crop harvested this year is estimated at 225,000 barrels, while the crop of New Jersey and the entire west is only estimated at 115,000 barrels. The New England crop alone returns to its growers, and those who are employed in the harvesting and shipping of the fruit, over \$1,200,000. While the yield in individual cases is oftentimes very large, the average yield is probably not over twenty-five or thirty barrels per acre per year. From a lot of one and one-quarter acres there have been harvested during the last thirteen years 924 barrels, or an average of about 56 barrels per acre per year. From another lot of eight acres there have been gathered during the last ten years 2,895 barrels, or an average of about 30 barrels per acre. The past season, from a lot of less than one hundred and forty rods, I have seen 148 barrels of fruit harvested, but such yields as this are not common.

The south-eastern portion of New England is especially well adapted to the crop, because frosts in that section seldom occur of sufficient severity to injure the berries before October 1 and many seasons not earlier than October 15. The land selected should have a peat or muck bottom, a site covered with trees or bushes being preferable to a grass growing turf. The poorer the soil about this swamp the better; a very light sandy soil upon a sub-soil of coarse sand rising abruptly from the edge of the swamp should be selected. A careful survey should be made to ascertain if the water level can be lowered from one and one-half to two feet below the surface; if this cannot be done the swamp is not desirable for the cultivation of the fruit.

If a natural reservoir is not at hand care should be taken to secure one above the level of the swamp, if possible, that the bog may be flooded during the winter season to protect from severe freezing, and during the spring and fall to destroy insects, of which we shall speak later. If a reservoir cannot be secured above the level of the land to be worked, oftentimes a nearby lake or large pond may be drawn upon, and if below the level of the lot to be planted an engine and large pump may be used with which the flooding can be done.

The lot having been selected, the trees and larger bushes should be cut about and their stumps tipped out by the aid of their tops and some mechanical power, a four-fold tackle being generally sufficient though a stump puller is sometimes used. The larger wood is taken to the adjoining upland, the stumps, brush and roots

burned; ditches are then cut around the outside, between the swamp to be planted and the adjoining higher land. These should be from one and one-half to two feet deep and from two to three feet wide, varying as the location be wet or dry, a very springy swamp not being as desirable as one which, though peaty or mucky, is not filled with active springs. The main waterway, which is usually to be found near the centre of the swamp should be straightened and deepened. Cross ditches are also cut at distances of from four to eight rods apart.

The brush and wood being disposed of, and the ditches completed, the surface is next made level. For this purpose thin bog or stub hoes, with a sharp cutting edge, are used, the smaller roots being cut off and raked out, when they in turn are burned or carried off. To assist in getting a level, the ditches are filled to within a few inches of the surface with water, this water line being very useful in securing the desired plane. A dam at the lower end of the tract is to be constructed, with gates, that the flowage may be regulated at will.

After the clearing, ditching and levelling have been completed, comes the sanding, for which purpose all soil is removed from the portions of the upland that the sand is to be taken from. This coarse sand is spread upon the surface to a depth of from three to six inches, more if the swamp is naturally wet or springy and inclined to a rank, vegetable growth, while the lesser depth may be sufficient if the soil is quite dry, and free from grass or water growth. This covering is usually carried on in barrows having a small wheel, these being run upon a one and one-half by eight inch plank for a track. The sand is raked to the desired thickness as fast as wheeled on, one man doing the levelling and moving the track, while three to six men, as the distance be long or short, wheel the sand. A common wooden hand hay rake, with half the length of the teeth cut away, is used for the levelling.

We are now ready to set the plants, which is preferably done in May, or between April 15 and June 10. The level, sanded surface is marked off eighteen inches apart each way. The cuttings are secured from a good, healthy growth of vines of the desired variety, being cut off at the ground with a common butcher knife, from four to six barrels of cuttings being needed to set an acre. A bunch of from five to eight of these cuttings is pressed firmly into the sand with a dibble to a depth of from three to five inches. The ditches are then nearly filled with water and the soil kept moist till the plants have rooted, after which the water may be dispensed with for a time, though it is well to nearly fill the ditches occasionally if the season be very dry.

The entire cost of preparing a plantation, including clearing of wood, ditching, levelling and sanding, should not exceed \$1.25 or \$1.50 per square rod, or from \$200 to \$250 per acre. Contractors accustomed to the work are usually to be found who will construct the plantations for the prices above named.

The setting of the vines, including the marking, can be done by those proficient in the work for ten cents per rod. These prices do not include cost of building dam or reservoir.

The bogs must be kept clear from weeds and all grass growth, hand weeding being depended upon for this purpose. The first season two or three weedings will be sufficient, unless it should be excessively wet and the location springy. The second season the vines should make a rapid growth, and twice weeding will probably be all that is necessary. The third season they should bear some fruit, though a full crop need not be expected until the fourth year. The weeds, bushes, etc., will show more or less every season as the plantation grows older, but, unless they are very troublesome, need not be taken out until after the crop is harvested, when all should be pulled, carried off and burned. If the grower has practised clean culture, he will still have the insects and elements to contend with.

The flooding previously alluded to is necessary during the winter season that the plants may not be destroyed by freezing, as was the case during the winter of 1900 and 1901, when large tracts that were not flooded were so badly injured that they did not fruit at all during the following season. Again, if one has a reservoir with a good head of water for use at will, it is often advisable to flood for a short time only, during the last part of May or first part of June, to destroy the "fire worm." This insect, *Rhopobota vacciniana*, often known as the vine worm or blackhead, has been very destructive in many sections of south-eastern Massachusetts. Flooding for a few hours in the early part of the season, just as the worms are hatching, has been quite satisfactory where plenty of water was at hand, but as there are only a few plantations so situated, insecticides and spraying have been resorted to. For this purpose many growers from 1885 to 1890 used a strong solution of tobacco with quite good results, while others used Paris green. At present, a solution known as arsenate of lead, prepared from a formula furnished by Professor Fernald of the Hatch Experiment Station, appears to be best of all. The spraying is done with a large force pump set upon a barrel or tank, mounted upon low, broad wheels, that it may be easily moved about the bogs. A line of hose with spray nozzle is attached, and while two men move the tank and work the pump a third directs the hose,

thoroughly sprinkling the entire surface. Three or four applications are usually made between May first and July first. It is a curious fact that some bogs are never troubled with this insect, while upon others, only a few rods away, it has entirely destroyed the crop.

The fruit or berry worm, *Mineola vaccinii*, is also quite a serious enemy, working upon the fruit only. To destroy this insect Paris green or arsenate of lead is sometimes used, the spraying being done just after the berries are set.

The root worm, which often destroys quite large tracts, works very similarly to the common red head white grub, that destroys our grass roots, and is, I believe, of the same family. Flooding the plantations to the level of the surface during August and September will usually check their depredations.

Many bogs are inclined to produce an excessive growth of vines which, in a few years, become brittle, and many of them die. To renew these and produce a healthy growth of bearing shoots, thinning or pruning is practised. The tool for this purpose is of about the size and shape of a common, wooden, hand hay rake, having a steel head, to which four or five knives for teeth are attached. These knives or teeth are about three inches long and are set about six inches apart in the head. The implement in use is drawn toward you like a hay rake and in this way quite a portion of the vines are cut away.

If the vines have not been trimmed, and have made an excessive growth, which is in places dead or very brittle, it is sometimes advisable to burn over the bog during the late autumn. Burning at this season does not affect the roots (if the ground is wet nearly to the surface), and a new growth of healthy vines may be expected, which will usually fruit the second or third year after. An inch or two of fresh sand spread among old vines will encourage a new growth and add life to the plantation. This is best applied in the late autumn, after the fruit is harvested, when the winter flooding will settle it among the vines. If not done before the water is frozen, if spread upon the ice it will drop into place when spring comes.

If the soil has a tendency to be hard and compact, and the vines fail to make a healthy growth, a light dressing of commercial fertilizer is sometimes used with very beneficial results; one containing a large per cent of potash and phosphoric acid is to be used rather than one high in nitrogen. An application of from 300 to 500 pounds per acre is usually sufficient.

There are at present quite a number of varieties of cranberry commonly grown, though three or four only produce seventy-five

per cent of the crop marketed. Probably fully one-half of the fruit in Barnstable and Plymouth counties is of the Early Black variety, a very heavy cropper, ripening about September first and usually a fair keeper for a berry harvested so early in the season. The Early Red is also a standard early berry. Later varieties include the Howe, Belle, Bugle, Matthews, Batchelder, McFarland and Centennial. The Howe is a standard fruit and probably more largely grown than any other late variety.

The so-called late kinds are usually in condition to harvest by September 20, and are generally all gathered by October 10. As the market is then quite well supplied with the early fruit, many of the late berries are gathered a little green and placed in the storage-houses to color and ripen.

The harvesting was formerly all done by hand, the fruit being gathered by the fingers, then when ready to be packed it was placed in long racks or screens, from which the defective berries and dirt were all taken. This large amount of hand labor made the harvesting very expensive, usually from \$3.50 to \$4.50 per barrel.

The section of bog to be harvested is divided by lines placed from six to eight feet apart, two workmen usually occupying the same row. There are now several patterns of scoops or picking machines used, the most common being a wooden box, with round, wooden teeth, twelve inches long and a half inch in diameter, projecting from the lower edge. A handle is attached to each side of the larger scoops, and the implement which is used in both hands, will hold from ten to twenty quarts. The smaller ones have one handle on the top, the same being held in the right hand, and this will hold from six to twelve quarts. The teeth are placed just far enough apart to allow the vines to pass between them, while the fruit is drawn into the scoop. In use these scoops are plunged into the vines just below the fruit, then tipped upward and forward, this motion clearing the teeth from the vines and leaving the fruit within.

Another machine which is largely used is known as the "Lambert patent." This is smaller than the first described, holding about two quarts. It has wire teeth, about six inches long, for the lower side of the box, the top and sides being hinged, with a movable front, which is held in place by a spring worked by the thumb, while the handle is held in the fingers. The teeth are shoved into the vines, the front is sprung to them, which pulls the berries into the scoop as it is withdrawn from the vines. This machine does not break off as many vines as the larger wooden scoop, and thus leaves the fruit in a cleaner condition.

In using these tools the pickers carry along a six or twelve quart

measure, into which they empty the contents of the machine. Those using the larger scoop have bushel boxes, which, when filled, are taken to the storage or packing houses. After picking, the fruit is run through winnowing or separating machines. These have a blower or fan to remove the light dirt, with either a tightly drawn belt upon which the sound fruit bounds, or a set of little inclined shelves over which it falls, the good fruit going to one receptacle and the defective to others. The patterns now in general use are the "Economist" and the "Middlesex."

After passing through these machines most fruit will have to be examined by the practised eye and nimble fingers of women, known as screeners. For this purpose the fruit is placed in long screens or racks, from which the remaining defective berries are picked by hand. These screens have slatted bottoms, through which the very small berries drop; they are about four and one-half feet wide at the upper end, tapering to one foot, and about eight feet long, with sides six inches high. The wide end is raised three or four inches above the narrow end, which is placed over the barrel or package in which they are to be shipped. About this screen three or four women stand, removing the defective berries. Unless the fruit is very badly decayed, this number with a man to move the fruit, will usually pack from fifteen to thirty barrels per day.

The bulk of the crop is marketed in barrels holding one hundred quarts, which are manufactured expressly for this fruit and cost about thirty-five cents each. Some of the markets call for a package holding only a bushel, for which a slat box is manufactured, to contain that quantity, with a partition through the centre.

By the use of the improved gathering and assorting machines, the cost of harvesting has been reduced from \$3.50 to \$4.50 in 1875 to from \$1 to \$2 per barrel the present season. If the grower is unfortunate enough to have any fruit not gathered when a white frost occurs, the berries will be more or less affected, which will add quite a little to the cost of harvesting.

The smaller growers dispose of their crop through commission houses in the large cities of New England and the middle States, while the large growers sell in car lots, a large part of their crop going direct to the western, southern and Pacific coast cities.

While I would not encourage indiscriminate planting of the crop, I believe under favorable circumstances and good management it is the most profitable crop grown in south-eastern Massachusetts.

